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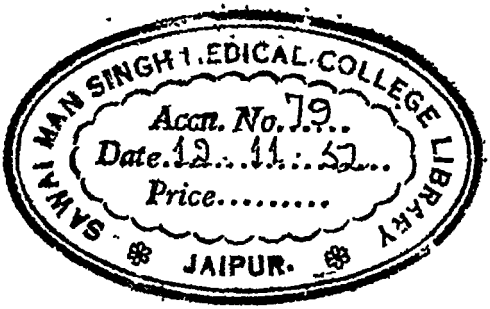

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In search of a given subject will find it useful to bear in mind that the references are in several cases distributed under two or more separate but nearly synonymous headings. Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Hospitals, which will be found under that heading, and Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word University. (*L*) = *Annotation*, (*C*) = *Correspondence*, (*LA*) = *Leading Article*, (*ML*) = *Medico-legal*, (*NT*) = *New Inventions*, (*O*) = *Obituary*, (*PCP*) = *Panel and Contract Practice*, (*PI*) = *Parliamentary Intelligence* and (*R*) = *Review*.

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ADDRESSES AND ORIGINAL ARTICLES

THE MECHANISM OF DIABETES MELLITUS*

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DEPUTY DIRECTOR MEDICAL UNIT UNIVERSITY COLLEGE HOSPITAL, LONDON

I

IN delivering these Goulstonian lectures I shall attempt to fulfil the spirit, if not the letter, of the conditions laid down by Dr Goulston when in 1632 he made his gift to this college He directed that his gift should be used to enable one of the younger fellows to demonstrate the results of a disease by dissection of a dead body My purpose in this and the subsequent two lectures will be to demonstrate the mechanisms of a disease by describing a sequence of experimental observations on the living subject I can approach this task in no better way than by first describing the clinical observations which originally directed my attention to the significance of one of the most important of these mechanisms

In the autumn of 1930 I had under my care a woman, aged 30, suffering from severe diabetes mellitus, and I was struck by the fact that, although she would in a short time lose large quantities of sugar in the urine, this loss of sugar from the body did not reduce the blood sugar level To test this observation I produced a profuse and periodic diuresis in the patient by giving her quantities of water to drink, and I found that the blood sugar remained stationary, even though the urinary excretion of sugar varied widely This observation was the more striking because in the periods of profuse diuresis more sugar would be washed out of the body in half an hour than was contained in the whole volume of the patient's blood, and yet the blood sugar remained steady at its original level Pursuing these observations further, I investigated the effect of loss of sugar in the urine on the rise of blood-sugar after the oral administration of glucose First, the degree of glycosuria and the blood sugar level in the fasting state were determined, 50 g of glucose was then given by mouth, and afterwards sufficient water was given to produce a continued diuresis The sugar content of the blood and that of the urine were estimated at regular intervals It was found that, although at the end of five hours an excess of 56 g of sugar had appeared in the urine, the blood sugar level was still 60 mg per 100 c cm higher than before the glucose had been given Similar observations were made on other patients and it was further found that the course of the blood sugar tolerance curve was uninfluenced by the degree of glycosuria (fig 1) By varying the diuresis the amount of sugar excreted in the urine was varied at different times during the course of the curve, but nevertheless the smooth rise and fall of the curve continued without wavering [37] To determine if the same significance could be attached to the blood sugar value in the normal person the same experiments were repeated on persons with renal glycosuria It is generally conceded that the metabolism in such cases is normal, and that the glycosuria is merely the result of a harmless functional peculiarity of the kidney Owing to the relatively small loss of sugar in the urine in renal glycosuria the results were not so dramatic as those obtained on diabetics, they were, however, sufficient to show clearly that the course of the blood-sugar in these cases also was not affected by variations in the amount of glycosuria [37]

These observations appear to me to be very significant They show that, within the limits of the experiments, the blood sugar level is unaffected by loss of sugar in the urine, even though glycosuria be so profuse that more sugar is removed from the body in the period of observation than is contained in the blood at any particular moment This can only mean that outflow of sugar into the urine is being actively compensated by an equivalent inflow of sugar into the blood This observation is incompatible with the old idea that the increased amount of sugar in the diabetic's blood represents a passive accumulation of unutilisable carbohydrate It suggests that at any particular time the blood sugar value is fixed by the body at a particular level, and that the maintenance of the blood-sugar at this particular level, whether in the fasting state or in the course of hyperglycæmia, is so important in the metabolism of the body that attempts to change it by physical means are swiftly and accurately countered The constancy of the fasting blood-sugar level in normal men and animals has been commented on by numerous observers The failure to realise that under constant dietary conditions the blood sugar tolerance curve after a dose of glucose also remains remarkably constant [42] can only be attributed to the casual way in which this test is usually performed. For purposes of studying the blood sugar tolerance accurate curves are necessary, and these require not only that frequent samples of blood be taken but also that the test must be carried out under conditions as strictly controlled as those required for estimation of the basal metabolic rate All the blood sugar curves reported in this paper have been carried out under such conditions The accurate measurement of the blood sugar tolerance curves thus obtained presented some difficulty until it was found that, although the contour of the curves obtained under constant conditions varied, the area bounded by these curves above the fasting blood-sugar level remained approximately constant [42] Table I shows that under constant conditions the area of the glucose tolerance curve remains remarkably constant It is difficult to believe that such constancy is without significance

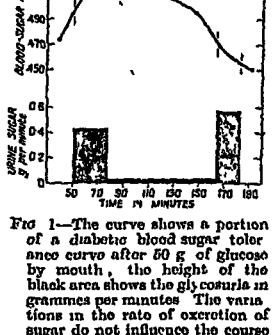

FIG 1—The curve shows a portion of a diabetic blood sugar tolerance curve after 50 g of glucose by mouth, the height of the black area shows the glycosuria in grammes per minute The variations in the rate of excretion of sugar do not influence the course of the blood sugar curve

* The Goulstonian lectures for 1939 delivered before the Royal College of Physicians of London on March 2, 7, and 9 Lects II and III, together with the references will appear in later issues

as due to the plethora of glucose in the blood increasing utilisation of sugar More recently Wierzuchowski [137 138] has shown that in normal animals the assimilation and oxidation of ingested glucose increase with the rate of its infusion and the rise of blood sugar up to a high limiting value Increase in the height of the blood sugar level similarly favours the action of insulin in normal subjects [55 61 66 119] Under constant conditions of diet the higher the level of the fasting blood sugar the greater the effect of a standard dose of insulin in depressing the blood sugar This relation between fasting blood sugar level and insulin effect has been closely investigated by Scott and Dotti,[119] who have shown that the effect of a standard dose of insulin in depressing the blood sugar is proportional to the height of the fasting blood sugar level on which it acts Recently Dr R B Kerr and I [66] have shown that a similar relationship governs the action of insulin in suppressing alimentary hyperglycæmia Under constant dietary conditions the greater the glucose tolerance curve the greater the effect of a standard dose of insulin in suppressing the glucose tolerance curve - It thus appears that, when the head of pressure of sugar in the blood is high, sugar utilisation and insulin action are facilitated, whereas, when the head of pressure of sugar is low, sugar utilisation and insulin action are retarded In healthy subjects the fasting blood sugar level varies relatively little The blood sugar tolerance curve of healthy subjects however, varies widely according to the different conditions under which it is obtained, and consideration of these variations and of the phenomena associated with them throws considerable light on the purpose behind their changes

ASSOCIATION BETWEEN INSULIN SENSITIVITY AND GLUCOSE TOLERANCE

It was noted by Claude Bernard [11] that when a carbohydrate rich meal was given to a starving dog glycosuria often followed In 1913 Bang [9] showed that starvation caused a high blood sugar tolerance curve—i e , lowered the tolerance of the animal for glucose Later Adlersberg and Porges [2 3] and Sweeney [129] showed that high fat diets caused a high tolerance curve, whereas high carbohydrate diets caused a low tolerance curve I have shown

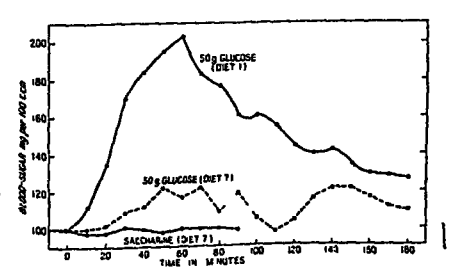

FIG 2—Three blood-sugar curves from the same healthy subject The curve on diet 1 shows the effect of a low carbohydrate diet on the glucose tolerance curve produced by oral administration of 50 g glucose; the curve on diet 7 shows the effect of an equicalorie high carbohydrate diet The saccharine curve is a control experiment showing that no rise of blood sugar follows the drinking of a solution of saccharine or is caused by the experimental technique [62]

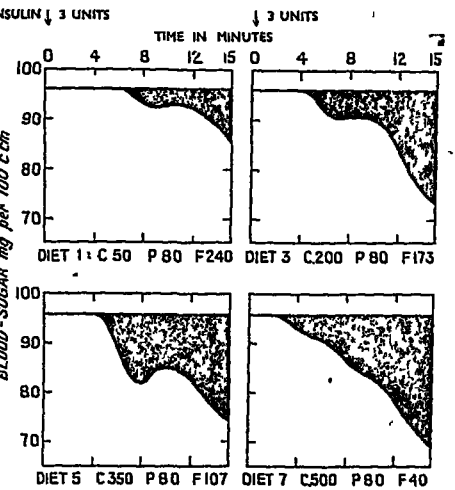
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FIG 3—Four insulin-depression curves, after injection of 3 units of crystalline insulin solution intravenously, obtained from the same healthy subject when taking diets containing different amounts of dietary carbohydrate [62]

that the sole dietary factor governing sugar tolerance is the absolute amount of carbohydrate in the preceding diet, with progressive restriction of dietary carbohydrate there is progressive impairment of sugar tolerance, which is shown by a corresponding heightening of the blood sugar tolerance curve [62] The results in a typical experiment are shown in fig 2, and a series of such curves measured by the method of areas is shown in table I It will be seen that, while the size of the areas depends on the composition of the preceding diet, repeated tests under constant dietary conditions show a remarkable degree of constancy It is therefore possible to vary the height to which the blood sugar rises after ingestion of a constant dose of glucose by varying the carbohydrate content of the preceding diet, but, if the dietary carbohydrate is maintained constant, the blood sugar tolerance curve remains constant also

The action of insulin in depressing the blood sugar level in normal and diabetic subjects is perhaps its most characteristic effect, and it is now realised that this action is not fixed but can be varied. When in the second of two tests the same dose of insulin depresses the blood sugar more rapidly than in the first, the insulin sensitivity of that subject is said to have increased It should be emphasised that the term "insulin sensitivity" applies only to the rate at which the blood sugar is depressed. The speed of return to normal levels is irrelevant, depending on factors other than insulin action The rate at which a standard dose of insulin depresses the fasting blood sugar level depends on the composition of the preceding diet [2 62 121] and as in the case of the glucose tolerance curve, it is the carbohydrate content of this diet which is the determining factor With progressive restriction of dietary carbohydrate there is progressive diminution in the effect of a standard

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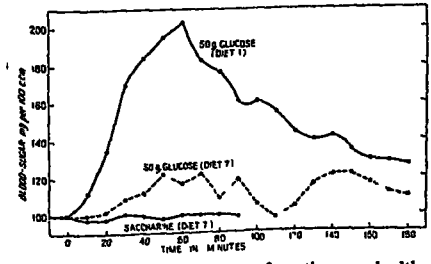

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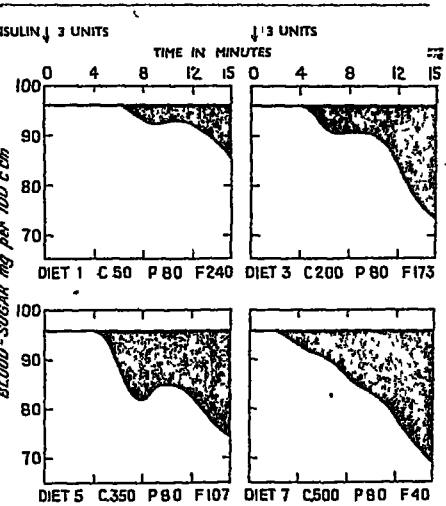
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Experiments on carbohydrate metabolism in animals provide numerous examples of this maintenance of the sugar in the blood at a particular level; they also provide examples of the disastrous results to the organism when the bodily mechanisms do not maintain this level. From the numerous animal experiments available two illustrative examples may be chosen: (1) the hypophysectomised animal fails to maintain the blood-sugar level partly, if not entirely, because of the diminished inflow of sugar from the liver to the blood; and (2) in phloridzin poisoning the animal fails to maintain the necessary blood-sugar level because of the excessive outflow of sugar into the urine

(1) When food is withheld from hypophysectomised animals the blood-sugar falls [26 33] and ultimately

TABLE I—CONSTANCY OF THE AREA DEMARCATED BY THE SUGAR-TOLERANCE CURVE WHEN A DIET WITH CONSTANT AMOUNT OF CARBOHYDRATE IS BEING TAKEN

Subject	Diet			Area of glucose tolerance in mg /min
	Carbohydrate	Protein	Fat	
I	100	80	218	6600 6500
II	50	80	240	9650 9450 8000
III	50	80	240	18,600 15,900
A	250 250 250	80 80 80	100 200 300	3500 3527 3534
B	55	88	202	11,960 13,090
	660	90	42	5590 5400
C	55	90	160	11,930 10,660
	660	90	42	4160 4550
D	56	87	255	10,890 11,100 10,750

The glucose-tolerance areas were terminated at the shortest time taken by any glucose-tolerance curve on the particular subject to return to normal. The interval between different glucose-tolerance tests on the same diet varied from three days to nine weeks. The figures demonstrate that the greatest discrepancies between duplicate experiments are found when a low-carbohydrate diet is being taken [66]

death results. It has been shown by Cope [22] that this spontaneous fall of blood-sugar does not take place before the liver-glycogen is practically exhausted. Up to this time the blood-sugar is maintained at normal levels, then, the source of sugar being exhausted, the blood-sugar falls to hypoglycæmic levels. There is strong evidence that in the absence of the hypophysis the ability to manufacture glucose from non-carbohydrate sources and consequently the ability of the starving animal to replenish its liver-glycogen are limited. It is therefore of particular interest that no attempt is made to eke out the supply of liver-glycogen by adjusting the blood-sugar level to markedly subnormal values. Until the liver-glycogen is used up, the blood-sugar is sustained at normal values; then it plunges down to low levels and death results.

(2) After administration of phloridzin to a normal animal, although there are effects on tissues other than the kidney,[103 134] the effects of the excessive glycosuria dominate the picture.[101 143] When phloridzin is given to a fasting normal animal, profuse glycosuria appears and continues for several hours before there is any change in the blood-sugar level. Then the blood-sugar level begins to fall, and, when this happens, it is found that the glycogen in the liver has diminished to minimal amounts. At the same time the increasing excretion of urinary nitrogen indicates an accelerating breakdown of body proteins while an increasing ketonuria and a fall of the respiratory quotient denote that the body is now driven to obtain its energy mainly if not exclusively from the combustion of fat.[104] The dependance of the sequence of events on the fall of blood-sugar is shown by the effect of the administration of glucose in rapidly restoring the animal to normal.[32] It appears that the fall of blood-sugar which takes place as a result of the excessive glycosuria is of such serious import to the economy of the body that in the attempt to sustain the blood-sugar at normal levels the proteins of the body itself are sacrificed to increase the production of endogenous sugar.

The foregoing results indicate that the fasting blood-sugar levels of the normal and of the diabetic are under given conditions actively maintained within certain levels, and that the degree of alimentary hyperglycæmia, as measured by the blood sugar tolerance curve, is under given conditions also actively maintained within definite limits. It is extremely unlikely that a constancy of this nature can be fortuitous, and it seems allowable to suggest that the blood-sugar level, in the circumstances existing at any particular time, is that which approaches nearest to the optimum for the needs of the body. This raises two questions. why in different circumstances should the optimal blood-sugar value be fixed at different levels, and how are the changes in optimal blood-sugar level brought about? The consideration of these questions will be facilitated if we anticipate the discussion of some of the evidence that follows and formulate now a working hypothesis. This can then be applied to the experiments as they are presented and its development into a theory followed. Utilisation of sugar by the tissues increases in proportion with the height of the blood sugar level.[87 126 137 138] It is suggested that the height of the blood-sugar level can be regarded, metaphorically, as a head of pressure of sugar in the blood. In health this head of pressure is within what we recognise as normal limits and ensures that in normal circumstances utilisation of carbohydrate by the tissues proceeds at an adequate rate. If however, the ability of the tissues to use sugar is diminished—e.g., by either lack of insulin or impairment of insulin action—compensation is made through an appropriate increase in the head of pressure of sugar in the blood. The rate of utilisation of sugar by the tissues is thus maintained relatively constant.[57] Using this hypothesis as a guide, we can now examine the changes in blood-sugar level and the associated alteration in bodily function which take place in normal and abnormal carbohydrate metabolism, and, if this guide prove to be true, we can hope eventually to construct a theory which renders these changes and their associated alterations intelligible.

SIGNIFICANCE OF VARIATIONS IN THE BLOOD-SUGAR LEVEL

We can best approach the question of why the blood-sugar level varies by considering the effects of manipulating the height of the blood-sugar level on sugar utilisation and on insulin action. The effect of the blood-sugar level on sugar utilisation in normal animals is well established. After ingestion of glucose the respiratory quotient and the consumption of oxygen rise, and Lusk [87] has explained this effect

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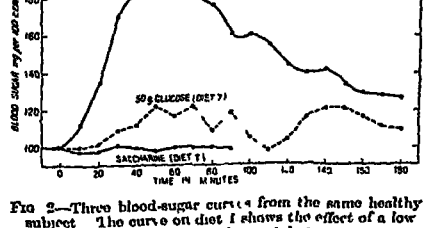

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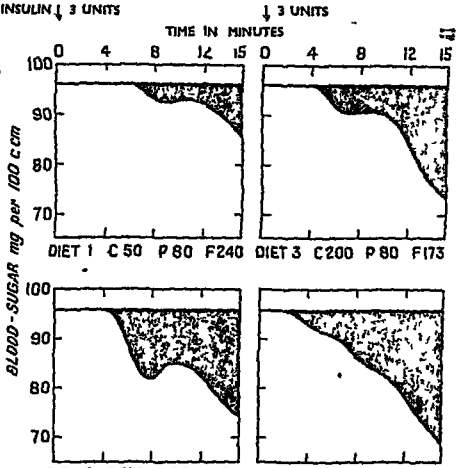
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The action of insulin in depressing the blood sugar level in normal and diabetic subjects is perhaps its most characteristic effect, and it is now realised that this action is not fixed but can be varied When in the second of two tests the same dose of insulin depresses the blood sugar more rapidly than in the first, the insulin sensitivity of that subject is said to have increased It should be emphasised that the term "insulin sensitivity" applies only to the rate at which the blood sugar is depressed The speed of return to normal levels is irrelevant depending on factors other than insulin action The rate at which a standard dose of insulin depresses the fasting blood sugar level depends on the composition of the preceding diet[2 3 62 121] and as in the case of the glucose tolerance curve, it is the carbohydrate content of this diet which is the determining factor With progressive restriction of dietary carbohydrate there is progressive diminution in the effect of a standard

dose of insulin on the fasting blood-sugar level, with the result that the blood-sugar is depressed more slowly and to a less extent, and the area traced out by the insulin-depression curve below the fasting blood-sugar level diminishes.[62] A typical experiment is given in fig. 3, which shows that, as the carbohydrate content of the diet is increased, the sensitivity of the subject to insulin increases, with the result that each unit of insulin disposes of more sugar in a given time. Thus increasing the dietary carbohydrate has a twofold effect: it improves the blood-sugar tolerance curve, and it improves the sensitivity to insulin. This association appears to be invariable. Before, however, considering why these changes in the sugar-tolerance curve are correlated with similar changes in insulin sensitivity it is necessary first to consider if the variations in sugar tolerance resulting from dietary changes can be explained by variations in the secretion of pancreatic insulin.

Closely related to the effect of dietary carbohydrate on the sugar-tolerance curve is the phenomenon first described by Hamman and Hirschmann,[53] who showed that periodic ingestion of constant amounts of glucose led to progressively smaller rises of the blood-sugar. This work has been confirmed and extended by Staub[128] and by Traugott,[132] by whose names the phenomenon is now usually known. The accepted explanation of the Staub-Traugott phenomenon is that each successive dose of glucose provokes an increased secretion of insulin. At first sight the explanation appears very probable, for there is considerable evidence that a rise of blood-sugar is an adequate stimulus to the secretion of pancreatic insulin. Soskin et al.,[121] however, have shown that in a depancreatised dog, receiving a constant injection of insulin sufficient to maintain its blood-sugar at normal levels, the periodic injection of constant doses of glucose still leads to progressively smaller rises of blood-sugar. The progressive improvement in sugar tolerance can thus be explained without postulating a progressive increase in the secretion of pancreatic insulin. Studying the same phenomenon I showed that repeated injections of glucose caused a corresponding increase in the insulin sensitivity of the animal.[61] It therefore appears that the Staub-Traugott phenomenon must be explained not as the result of a progressively increasing secretion of endogenous insulin but as the effect of a constant amount of insulin in the presence of a progressively increasing sensitivity to insulin.

The correlation between the changes in glucose tolerance and in sensitivity to insulin induced by change in the carbohydrate content of the diet has been indicated above. On closer examination this correlation is found to be surprisingly exact. If the effects of several diets differing in carbohydrate content are tested on the glucose-tolerance curve and on the insulin-depression curve, it is found that changes in glucose tolerance are accurately correlated with proportionately equal changes in sensitivity to insulin. In other words, dietary changes in glucose tolerance can be adequately accounted for by changes in the sensitivity of the subject to his own pancreatic insulin.[62] This conclusion carries an implication which accords with the experiments of Soskin quoted above: that the amount of insulin secreted by the normal pancreas in response to ingestion of a standard dose of glucose is constant; and it suggests further that the secretory response of the islets of Langerhans to a plethora of glucose is of the "all or none" type.

It is now possible to see a purpose underlying the variations in the glucose-tolerance curve which result from changes in dietary carbohydrate. It has been shown that under constant conditions the effect of insulin in depressing the fasting blood-sugar level, or in suppressing the rise of blood-sugar after ingestion of glucose, increases with the height of the blood-sugar. After restriction of dietary carbohydrate the sugar-tolerance curve rises to levels higher than normal. Under the same conditions sensitivity to insulin is depressed. It will be seen that this change in the sugar-tolerance curve is such that it tends to counteract the effect of diminished sensitivity to insulin. When insulin sensitivity becomes impaired, there is a compensatory increase in the head of pressure of sugar in the blood during the course of the sugar-tolerance curve. This facilitates the action of insulin on the blood-sugar, with the result that the effect of the insulin secreted by the pancreas remains unimpaired. Direct evidence in favour of this view has recently been obtained.[66] It was found that, when insulin sensitivity was constant, the effect of a standard dose of insulin in suppressing the glucose-tolerance curve was proportional to the height of the curve on which the insulin acted. Now, the size of the blood-sugar tolerance curve can be varied by varying the carbohydrate content of the preceding diet, but this procedure also changes the sensitivity to insulin. In each of the different conditions of insulin sensitivity produced it was found that the effect of a standard dose of insulin in suppressing the blood-sugar curve remained constant and was no longer proportional to the height of the curve. Thus the same amount of blood-sugar was removed by the standard dose of insulin when the curve was high and the sensitivity to insulin low as when the curve was low and the sensitivity to insulin high. The increased head of pressure of sugar in the blood had compensated the diminished sensitivity to insulin. If the conditioned variations in the blood-sugar which we have been considering have as their object the neutralising of the effect of changes in insulin sensitivity, it is important to know what would be the effect of such variations in sensitivity to insulin if no such neutralising mechanism existed.

INSULIN SENSITIVITY AND THE UTILISATION OF BLOOD SUGAR BY THE PERIPHERAL TISSUES

The peripheral action of insulin was clearly demonstrated by Mann and Magath[94] and by Burn and Dale.[18] Mann and Magath showed that after hepatectomy in dogs insulin produced a fall of blood-sugar comparable with that observed in normal animals; and Burn and Dale demonstrated that insulin caused the disappearance of large quantities of infused sugar in decapitated eviscerated preparations. This work was extended by the experiments of Frank, Nothmann, and Wagner,[46] who showed that injection of insulin, both in the intact and in the depancreatised dog, caused an increase in the abstraction of sugar from the blood, as shown by an increase in the arteriovenous (A-V) sugar difference, and moreover that after intra-arterial injection of insulin the A-V sugar difference was most obvious in the limb supplied by that artery. There is now no doubt that the action of insulin in the peripheral tissues is not constant but depends on other factors. It has been shown, for example, that after treatment with extracts of the anterior-pituitary gland the action of insulin is greatly reduced both in promoting deposition of muscle-glycogen in eviscerated preparations[98] and in accelerating the fall of blood-sugar in rabbits in which the liver is excluded.[69] Direct evidence that the carbohydrate content of the preceding diet influences the uptake of sugar by the peripheral

tissues has been brought forward by Drury [84] and endorsed by Mann [82 83] These authors have found that after hepatectomy the spontaneous fall of the blood sugar is faster, and the amount of sugar that must be infused to keep the blood sugar constant is greater, when the animals have previously received a diet rich in carbohydrate than when they have been starved This work has been denied by Soskin,[122] but it is doubtful if his preparations were suitable for investigation of the delicate variations in the peripheral uptake of sugar as a result of dietary changes It thus appears that conditions which diminish sensitivity to insulin also diminish the ability of the peripheral tissues to utilise the blood sugar

In the intact animal or human subject the only method available for studying the rate of removal of sugar by the peripheral tissues is to measure the difference between the sugar content of the arterial blood entering a limb and that of the venous blood leaving the limb [45] An increase in this A-V sugar difference indicates an increased rate of removal of sugar by the peripheral tissues A diminished A-V sugar difference is found in depancreatised dogs [46] and in human cases of diabetes mellitus,[82a] and this difference is restored to normal by injection of insulin In a normal subject the A V sugar difference in the resting state is small, but after ingestion of sugar the difference increases as the blood sugar rises, and then decreases to the fasting value as the blood sugar falls [50] This increase in the A-V sugar difference is attributed to the action of the pancreatic insulin secreted in response to the rise of blood sugar, and the effect of this pancreatic insulin in causing the peripheral tissues to remove the blood sugar can be measured by the area enclosed between the arterial and the venous blood sugar tolerance curves In fig 4 is shown an example of two experiments on the same healthy subject, in which after ingestion of a standard dose of glucose both capillary and venous blood sugar curves were estimated In one experiment the subject was taking a low carbohydrate diet, in the other a high carbohydrate diet The area enclosed between the capillary and venous blood sugar curves is the same in each case, indicating that the removal of sugar by the peripheral tissues was the same in both experiments But according to the results on hepatectomised animals the peripheral tissues should have removed less sugar from the blood when the subject was taking a low carbohydrate diet than when he was taking a high carbohydrate diet It has already been shown, however, that the removal of sugar from the blood increases as the head of pressure of sugar in the blood rises It thus appears that in the above experiments, when the low carbohydrate diet was being taken, the diminished ability of the peripheral tissues to remove sugar was compensated by the increased height to which the blood sugar rose, with the result that the action of the pancreatic insulin in promoting removal of sugar from the blood by the peripheral tissues remained the same as when the subject was taking a high carbohydrate diet The evidence thus points to insulin sensitivity being a phenomenon of the peripheral tissues and indicates that the purpose underlying the variations in the blood sugar tolerance curve resulting from dietary changes is to maintain relatively constant the supply of sugar to the peripheral tissues

So far as is known, the main consumption of sugar takes place in the extrahepatic tissues, and it might therefore be expected that, if insulin sensitivity is a phenomenon of these tissues, wide variations in insulin sensitivity would be associated with detectable variations in the oxidation of sugar The most important work in this field is that of Dann and Chambers [39] on the effect of starvation on the specific dynamic action of glucose When glucose is given orally to a dog, the increased oxidation of sugar is indicated by a rise both in the consumption of oxygen and in the respiratory quotient In dogs starved for three weeks this effect of glucose is greatly reduced At the time when this work was done it was generally accepted that starvation decreased the output of pancreatic insulin The work we have been considering, however, shows that it is the sensitivity to insulin

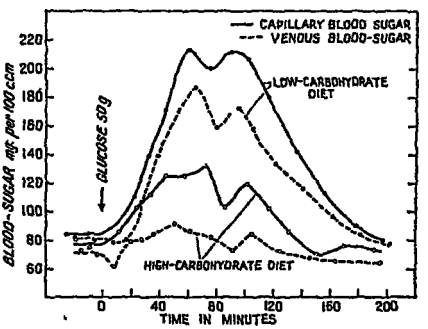

FIG 4—Two experiments in the same healthy subject, showing the rise of capillary blood-sugar and the rise of venous blood-sugar after ingestion of 50 g of glucose Before one experiment the subject was taking a low-carbohydrate diet, before the other a high carbohydrate diet The area enclosed between the capillary and venous blood sugar curves indicates the amount of sugar removed from the blood by the peripheral tissues The areas are approximately equal in both experiments [50]

which is decreased by starvation, and it is therefore significant that Dann and Chambers found that large doses of insulin did not restore to normal the ability of the starved dog to oxidise carbohydrate These workers showed, however, that the oxidation of glucose in dogs could be restored to normal in three or four days by repeated administration of glucose, a measure which increases the degree of sensitivity to insulin In man Baur [10] found that the consumption of oxygen by men receiving a low carbohydrate high fat diet was significantly lower than when they were taking a high carbohydrate low fat diet This finding has been confirmed, but it also appears that after ingestion of glucose the resulting rise in the respiratory quotient indicates that the proportion of the ingested glucose oxidised when taking either of the two diets is not greatly different [27] Thus restriction of carbohydrate coincidentally impairs insulin sensitivity and ability to oxidise glucose, whereas administration of carbohydrate restores both these properties When the sensitivity to insulin is moderately decreased, as by simple restriction of dietary carbohydrate, the coincidentally decreased ability to oxidise carbohydrate is compensated When, however, insulin sensitivity is much impaired, as by prolonged starvation, the compensation may be inadequate, and ingestion of glucose may not produce the full normal increase in metabolism

The importance of insulin sensitivity in carbohydrate metabolism is now apparent Decrease in

insulin sensitivity, if uncompensated, leads to diminished utilisation of sugar. To counteract this diminution of sugar utilisation the blood-sugar curve is elevated and the head of pressure of blood-sugar thereby increased. As a consequence of this increased head of blood-sugar pressure the action of the insulin secreted by the pancreas is facilitated. The impaired sensitivity to insulin is thus compensated, with the result that the rate of utilisation of sugar by the tissues is maintained within relatively normal limits (table II). This problem of insulin sensitivity has been considered in some detail because it provides an excellent example of the reaction of the body when its ability to utilise carbohydrate is impaired. These reactions take place in the healthy subject and cannot be considered abnormal. When we come to consider the diseases in which ability to utilise carbohydrate is impaired, we shall see that these same reactions are much in evidence. The thesis which I shall then be concerned to develop is that these reactions, particularly the hyperglycæmia of diabetes mellitus, are not abnormal processes, deleterious in themselves, but manifestations of an attempt to compensate the impaired ability of the tissues to utilise carbohydrate.

TABLE II—EFFECT OF CHANGE IN INSULIN SENSITIVITY

Insulin sensitivity	Effect	Compensation	Result
Diminished	(a) Insulin action impaired (b) Utilisation of sugar impaired	Increase in height of blood-sugar	Sugar utilisation approximately normal
Increased	(a) Insulin action increased (b) Utilisation of sugar increased	Decrease in height of blood-sugar	Sugar utilisation approximately normal

A NEW SERUM IN THE PASSIVE CONTROL OF SCARLET FEVER

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IT is difficult to know how far one is justified in recognising scarlet fever as a disease per se rather than as one of the results of infection of the upper respiratory tract by certain strains of hæmolytic streptococci. That the latter view is fundamentally correct has long been apparent on clinical and epidemiological grounds, but conclusive proof was not forthcoming until the introduction by Griffith (1934) of the serological classification of the hæmolytic streptococci. The hæmolytic streptococci concerned are chiefly the many serological types which fall into Lancefield's group A and need not be further particularised here. The clinical condition caused by infection with such an organism depends partly on the site of the infection—e.g., upper respiratory tract, genital tract in the puerperium, and wounds—and partly on the immunological condition of the person infected. With an infection of the upper respiratory tract in the absence of circulating antibody to the erythema (Dick) toxin, scarlet fever develops; when the specific antibody is circulating in sufficient concentration the toxin is neutralised, the rash does not appear, and the diagnosis is tonsillitis, septic sore-throat, or the like. It follows that such infections or their complications—e.g., otitis media, rhinitis, and mastoiditis—may produce secondary cases of scarlet fever if transmitted to Dick-positive subjects. Similarly, hæmolytic streptococcal "colds," infected wounds, or discharges may be responsible for secondary cases of scarlet fever.

The rational method of classifying these infections is evidently bacteriological rather than clinical, as in enteric and pneumococcal infections. Administratively, however, scarlet fever is still an entity, since it is a notifiable disease, whereas its congeners (other than erysipelas and puerperal infections) are not. Moreover, in communities containing a relatively large proportion of Dick-positive reactors it is likely to be the most frequent manifestation of hæmolytic streptococcal infections of this type. Thus in the wards of a children's hospital, where commonly half or more of the patients are Dick-positive, scarlet fever constitutes the most striking evidence of the existence and spread of cross-infection with this group of organisms.

Like many other hospitals, the old Hospital for Sick Children admitted septic otorhinological cases to a general surgical ward. Such a ward offers considerable opportunity for cross-infection with hæmolytic streptococci (Okell and Elliott 1936) and is likely to present an undue number of cases of scarlet fever. By dint of careful barrier nursing the number of cases of scarlet fever was kept commendably low, the figures being —

1934	5 cases	1936 .. .	3 cases
1935 . .	9 „	1937 (1st half) ..	4 „

Pending the opening of new wards with adequate isolation accommodation, it was decided to administer scarlet-fever antitoxin prophylactically to all cases on admission to this ward, in an attempt to reduce still further the number of cases of scarlet fever.

EXPERIENCE WITH EARLIER SERUM

The successful routine use of a serum prophylactically on such a scale depends not only on its efficacy as a preventive but also on its liability to cause serum reactions. Although ad-hoc records had not been previously kept, the opinion was held at Great Ormond Street that the commercial scarlet-fever sera then in use at the hospital were reliable prophylactics but caused serum reactions in an undue proportion of patients. These reactions, although very rarely dangerous, were often severe and interfered with the well-being and treatment of the patients.

The proportion of patients exhibiting reactions after the injection of sera in general varies from one batch of serum to another, with individual sensitivity, but especially according to the amount of protein injected. The most recent published figures agree remarkably closely: 21·9 per cent. for diphtheria antitoxin (Davis 1938); 28·1 per cent. for diphtheria antitoxin and 22·7 per cent. for scarlet-fever antitoxin (Hunt 1932). At Great Ormond Street one had the impression that stock scarlet-fever antitoxin used in 5 c.cm. doses gave a substantially higher figure, some batches giving reactions in quite half the patients.

TECHNIQUE AND RESULTS WITH REFINED SERUM

It was therefore decided to give a trial to the scarlet-fever antitoxin introduced by Lederle Laboratories. According to the makers, these sera are refined and concentrated by a process of "selective and controlled digestion of the inactive, reaction-producing proteins by means of proteolytic enzymes."

The sera are said to contain the pseudoglobulin fraction only and are claimed to give a very low incidence of serum reactions The dosage recommended for passive protection against scarlet fever is 1–1 5 c cm (100,000 original neutralising units) Past experience with other sera suggested that this dosage was excessive for our purpose, for the patients at Great Ormond Street are all under twelve years of age Accordingly a routine dosage of 0 75 c cm. (75,000 original neutralising units) was employed Babies under four months of age were not injected, for they are usually Dick negative

Most patients received their serum within a few hours of admission and virtually all within twenty-four hours A few patients remaining in the ward for periods of only a few hours did not receive serum The serum was given intramuscularly in the deltoid region or thigh indifferently No distinction was made between patients receiving serum for the first time and those who had had serum on a previous occasion The ward sister and her nurses were instructed to report all disturbances, however slight, which might conceivably be referable to the administration of serum

The period during which serum was thus given as a routine was from July 27, 1937, to Aug 4, 1938 (just over a year), and 658 patients received the serum During the course of the trial 1 case of scarlet fever developed in the ward This case cannot be recorded as a failure of the serum to protect in that the child had been forty eight hours in the ward before the administration of serum and that signs of scarlet fever appeared within a few hours of the injection

The serum has also been employed in the control of scarlet fever in the general medical and surgical wards The method of dealing with scarlet fever in these wards has been (1) immediate removal of the primary case, (2) Dick testing of all contacts, and (3) the administration of Lederle serum 0 75 c cm to all positive reactors within twenty four hours of the diagnosis of the primary case During the period under review there have been 14 primary cases of scarlet fever in the general wards, involving 135 Dick positive contacts They were dealt with as above, and no secondary case developed

As is so often the case in human protection experiments, there is no means of estimating how many susceptibles did in fact make effective contact and therefore would have developed scarlet fever if not passively protected Obviously efforts were made to make the number as small as possible The results in the otorhinological ward, where no case of scarlet fever developed during the twelve months in which routine serum was given as against 3–9 cases in the previous years, are no doubt within the range of chance variation The results obtained in the general wards are certainly not open to this criticism

Less favourable results have been obtained by Dr McSweeney at the Cork Street Fever Hospital, Dublin He has had several failures to protect when using Lederle serum to control the introduction of scarlet fever to diphtheria wards The conditions in his series were less favourable in that they were cases "whose resistance was at a very low ebb, exposed to pretty intensive infection with hæmolytic streptococci" (McSweeney 1939) There is also the possibility that the serum may not be equally effective against every type of scarlatinal streptococcus

The number of patients recorded as showing serum reactions is 10 out of a total of 703 receiving serum—i e, 1 2 per cent In 2 of the cases the reaction was local only, in the remainder there were general reactions, usually with an urticarial type of rash It is probable that a few cases developed reactions after discharge from hospital, but, even when allowance is made for this source of error, the percentage of reactions is remarkably low, especially when it is remembered that no precautions were taken in reinjecting patients who had had serum previously

SUMMARY

A new scarlet fever antitoxin (Lederle Laboratories) has been tested as a means of passive prophylaxis in the wards of a children's hospital

Secondary cases were practically abolished during the year in which it was used

In prophylactic doses it gave rise to serum reactions in less than 2 per cent of cases

My thanks are due to the members of the honorary staff to whose cases these figures relate and to Dr D N Nabarro, director of the pathological department, for much help and advice The work was done during the tenancy of a grant from the Sir Halley Stewart Trust

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THE ÆTIOLOGY OF POLYARTHRITIS IN THE RAT

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IN a number of papers Collier (1938 and 1939a, b) and Collier and Fasoveld (1938), working in Java have reported on a spontaneous polyarthritis of rats which can be transmitted in series, but of which the ætiological agent has not been isolated A very similar condition was demonstrated to one of us in 1930 in Nigeria by Mr R S Marshall, M R C V S, whose observations have not yet been published A closely allied condition has been found in rats in our own laboratory and in the rat colonies of two other laboratories in London The object of the present communication is to show that the causal agent of this disease is a pleuropneumonia like organism

THE SPONTANEOUS DISEASE

The disease has been seen in pure-bred black and white rats and in albino rats of the Wistar strain The joints most commonly affected are the tibio tarsal and the radiocarpal; less frequently the inter tarsal or phalangeal joints are swollen In the spontaneous disease, it is not uncommon to see three or all four of the limbs involved The first signs of swelling of an affected joint are accompanied by a glistening appearance of the skin, which is smooth and pearl coloured Often these appearances are localised to one small nodule Later the whole region of the joint takes on a pink and even purplish tint and is slightly œdematous This condition may eventually subside, leaving some thickening round the

joint; or, while the joint is still swollen, the skin may ulcerate and the limb below the joint may be gnawed off by the rat. The skin can be easily stripped off affected joints in the early stages, showing in the case of the tibiotarsal joint a fusiform swelling, of a pearly colour. On cutting the swollen tissues, straw-coloured fluid may be liberated.

Attempts to transmit the disease were made by removing the skin from affected joints with aseptic precautions and grinding up the whole joint with sterile sand. Normal saline was then added to make an approximately 10 per cent suspension and, after centrifugation at 3000 r.p.m. for 10 minutes, the supernatant fluid was inoculated into the pad of the hind foot of half-grown rats in doses of 0·2 c.cm. The first symptoms appeared usually in the tibiotarsal joints, more rarely in one of the intertarsal joints, after an interval of 4–6 days. In very large rats the incubation period was as long as 10 days, while certain full-grown rats showed no symptoms of infection.

ISOLATION OF A PLEUROPNEUMONIA-LIKE ORGANISM

Smears from affected joints showed the presence of large numbers of polymorphonuclear leucocytes and on occasions bacteria. Histologically, in the early stages, there was infiltration round the joint with polymorphonuclear leucocytes and large mononuclear cells. Later, fibroblasts appeared and what suggested pannus formation was noted. Finally the joint cavity was invaded, with disappearance of articular cartilage and absorption and disorganisation of the epiphysis.

The first step in the attempted isolation of the causal agent was the filtration of the affected joint tissues. A 10 per cent. suspension having been centrifuged as before, the supernatant fluid was filtered through gradocol membranes with A.P.D. of 940 mμ, 790 mμ and 680 mμ under a pressure of 3 atmospheres of nitrogen. The filtrates were then inoculated in doses of 0·2 c.cm. into the pads of half-grown rats together with a small amount of sterile agar: cultured on ordinary bacteriological media the filtrates showed no growth. Six to eight days after inoculation the tibiotarsal joints of the rats began to swell and a week later the joints were very definitely affected. Attempts at culture were made from joints thus infected by filtrates. No growth was obtained on the more commonly employed bacteriological media, but when agar or broth containing about 20 per cent. of defibrinated rabbit blood was employed, or when joint fluid was spread on Kheneberger's "special medium," growth was obtained of an organism whose growth characteristics and morphology resembled those of other pleuropneumonia-like organisms, more especially the organism which we have termed L5 (Findlay et al. 1938).

These agar and broth cultures, with the addition of sterile agar, when injected into the pads of rats caused swelling of the tibiotarsal joints after an interval of 4–6 days, and the appearance of the same symptoms as are caused by the injection of a suspension of the affected tissues. Histologically, the experimental does not differ from the spontaneous disease. Polyarthritis may occur in the experimental disease. Thus in one instance a rat inoculated into the pad of the right hind foot developed an acute arthritis of the left knee-joint 16 days later. Injected intravenously in rats of 50 g. body-weight in doses of 0·5 c.cm. fluid cultures induce polyarthritis in 5–8 days.

The pleuropneumonia-like organism, which is provisionally termed L7, is present in affected joints for considerable periods. During the acute stage it can be obtained in small amounts from the heart blood, popliteal lymph-nodes and spleen. L7 has been cultivated on the chorio-allantoic membrane of the developing chick embryo and reinoculation of the infected membranes in the pads of rats causes typical arthritis. Intracerebral injection of cultures in rats as a rule causes no symptoms, but in one instance a rat was moribund 4 days after injection. The brain of this rat contained the organism which further observation shows may remain latent in the brain for considerable periods, certainly up to 21 days.

Attempts have been made to infect species other than the rat.

Injection of agar cultures of L7 in the knee-joint of pigs was without effect, while injection in the pad of the foot of rhesus and cercopithecus monkeys and of rabbits, voles, guineapigs and hedgehogs produced no rise of temperature and no swelling of the joints. Injection of either infected filtered material from the rat or cultures of L7, mixed with agar, into the pads of mice gave rise, however, to swelling of the tibiotarsal joint in 2–7 days: the swelling may persist for 5–6 weeks. Without the addition of agar, little or no reaction is produced in mice. In some mice injection of cultures into the pad causes also a gelatinous œdema of the subcutaneous tissues of the abdominal wall, followed by death. Cultures of L7 on agar have also been injected intracerebrally into mice and give rise in 2–7 days to a fatal condition, associated with weakness in the hind legs, hunched back, coarse tremor and a tendency to turn in circles with the tail as a fixed point. Not infrequently, the skin over the frontal region becomes thickened, indurated and the eyes may be closed by a sticky exudate. In the first passage only one or two mice may show symptoms, but repeated passage, especially with the addition of sterile agar, causes 60–80 per cent. of the mice to develop cerebral symptoms. Histologically no lesions are seen in the brain beyond a slight degree of meningitis.

Cultures inoculated intravenously or intraperitoneally in doses of 0·5 c.cm. cause death in a high percentage of animals. In those that survive for 48 hours pleural or peritoneal exudates and arthritis are common. Intranasal instillation causes pneumonia in 5–8 days.

Smears from the brains of inoculated mice show the presence of large numbers of polymorphonuclear leucocytes and of rings, granules and comma-shaped structures which we have learnt to associate with infection by pleuropneumonia-like organisms isolated by us from mice (Findlay et al. 1939). Similar bodies have been seen in rat brain inoculated with agar cultures, in the chorio-allantoic membrane of the chick embryo, and in blood-broth cultures 24 hours after inoculation. They exhibit certain morphological similarities to the parasite known as *Eperythrozoon coccoides* and found in the blood of splenectomised mice. Like them the bodies stain readily by Giemsa's method and give a positive Feulgen reaction for nucleic acid. It seems that all pleuropneumonia-like organisms require an adjuvant such as agar or cells to start infection, if injected into animals. Mettam and Ford (1939), adopting Daubney's method (1936), demonstrated this recently in experiments on cattle with pleuropneumonia itself, and previous observations (Findlay et al. 1938) have emphasised its importance in regard to pleuropneumonia-like organisms in rodents. Collier (1939b) was unable to produce polyarthritis in mice.

Collier (1939a) showed that the injection into rats of certain organic gold preparations, Aurodetoxin

and Solganal B, prevented the development of polyarthritis in rats we have now been able to confirm and extend his results with solganal B by showing that this compound prevents the development of arthritis in both rats and mice injected with cultures of the pleuropneumonia like organism L7 Solganal B and other organic gold compounds also have a very remarkable effect in preventing symptoms in mice injected intracerebrally with L4, L5 and L6, other pleuropneumonia like organisms isolated from rats and mice

RELATIONSHIP OF L7 TO OTHER PLEUROPNEUMONIA-LIKE ORGANISMS

During the past few years observations have shown that the group of pleuropneumonia like organisms is very widely distributed On the one hand, saprophytic agents such as those described by Laidlaw and Elford (1936) and Seiffert (1936 and 1937) in sewage, humus, earth and similar materials undoubtedly belong to this group, as do the agents responsible for pleuropneumonia in cattle and agalactia in sheep and goats Incidentally, it is of interest to note that arthritis is by no means uncommon in goats affected with agalactia According to Pigoury (1938) arthritis occurs in 10–20 per cent of these animals, coming on usually about a week after the beginning of the disease One joint alone is as a rule attacked, generally that between the radius and the carpus, more rarely the tibiofemoral or the tibio astragaloid joint The symptoms vary from simple stiffness to acute arthritis with complete functional incapacity Spontaneous cure usually takes place after one or two months, but in some cases ankylosis is complete Serous inflammation of the joints is occasionally described as a late symptom in pleuropneumonia of cattle

At least four different species of pleuropneumonia like organisms have been isolated from mice L1 obtained from mice and rats is associated with *Streptobacillus moniliformis* (cf Kligneberger 1936 and 1938) This organism may occasionally produce arthritis in mice L3 has been found in the lungs of rats suffering from "bronchopneumonia" (cf Klieneberger and Stebbben 1937) and has recently been isolated from the brain of an apparently healthy mouse L5 was isolated from the brains of mice showing curious nervous symptoms—rolling disease (Findlay et al 1938) a very similar organism was subsequently identified by Sabin (1938) as the causal agent of a similar condition in America In America, Sabin (1939) has also isolated a pleuropneumonia-like organism from the brain of an apparently normal mouse Both L5 and this latter organism may produce an arthritic condition in mice when injected intraperitoneally or intravenously in large doses In this country, Findlay et al (1939) have also obtained on numerous occasions from mouse brains a pleuropneumonia-like organism L6, which differs from L7 serologically and in its growth characteristics This organism is also capable of producing arthritis in about 30 per cent of mice In rats, Woglom and Warren (1938a and b) described a progenic condition which they at first regarded as due to a filtrable virus This has now been shown by Klieneberger (1939) and Woglom and Warren (1939) to be due to a pleuropneumonia like organism L4, which is quite distinct from the mouse pleuropneumonia like agents L1 can, however, be adapted to mouse brains Recently Swift and Brown (1939) claim to have isolated from exudates and skin nodes in rheumatic fever in man a pleuropneumonia like organism which they have been able to grow on the chorio-allantoic membrane of eggs and have also passaged in mice

Attempts have been made to compare L7, the organism isolated from rat polyarthritis, with other pleuropneumonia like organisms obtained from rodents When L5 and L6 are injected into the pads of rats no arthritis results and the symptoms on intracerebral injection in mice are different L4, injected into the pad of rats and mice, produces an arthritis indistinguishable from that caused by L7, but its pathogenicity for mouse brains is greater than that of L7, while smears from the brains of mice infected with L4, although revealing structures not unlike virus elementary bodies, have shown no rings similar to those produced by L5, L6 and L7 L4, however, produces the same infiltration of the skin of mice following intracerebral inoculation L7, injected subcutaneously into rats, causes no formation of pus as does L4 In its growth characteristics on solid media L7 resembles in certain respects L5, though it develops more slowly Mice immune to L5 and L6 can be infected with L7

Further work, however, is required to determine the exact relation of L7 to other pleuropneumonia like organisms of rodents L7 is killed after heating for 30 min at 50° C It passes gradocol membranes with A P D of 560 mμ and 440 mμ but not 300 mμ It can be preserved in 50 per cent glycerin saline for 22 days it resists freezing and drying and a 0·5 per cent solution of phenol for at least a week at 4° C The greater part of a suspension is sedimented after centrifugation at 15,000 r p m for two hours

DISCUSSION

The spontaneous infectious polyarthritis which we have described in rats in London appears to be identical with, or very closely related to, the condition observed by Collier (1938) in Batavia except that his condition was not transmissible to mice It also resembles the condition observed by Marshall in Nigeria, referred to above, in a stock of laboratory rats maintained there It would thus seem as if the disease were by no means rare, and of wide geographical distribution, although no mention of it is made by Jaffé (1931) The isolation from this spontaneous rat polyarthritis of a pleuropneumonia-like organism is at the present moment of considerable interest since Swift and Brown (1939) claim to have obtained a pleuropneumonia-like organism from two cases of human rheumatism The possible bearing of our observations on human rheumatic conditions is now being actively investigated The fact that a spontaneous infectious polyarthritis can be studied experimentally under laboratory conditions is likely to throw further light on the human disease In this connexion, chemotherapeutic experiments, which will shortly be published in full, are of special interest, for gold salts have long been employed empirically in the treatment of human arthritic infections and these salts appear to have a remarkable action on experimental infections with the pleuropneumonia like organisms of mice and rats The sulphonamide group of drugs on the other hand has no action on the polyarthritis of rats In the pleuropneumonia like organisms there appears to exist a group of agents many of which have a tendency to produce arthritis in various animal species

CONCLUSION

A pleuropneumonia like organism has been isolated in pure culture from a spontaneous polyarthritis in

the rat, and has been shown to be the causal agent of the disease.

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BACTERIOSTATIC ACTION OF SULPHANILAMIDE IN VITRO

INFLUENCE OF FRACTIONS ISOLATED FROM HÆMOLYTIC STREPTOCOCCI

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SINCE the introduction of the sulphanilamide group of drugs in the treatment of infections, their mode of action has been much discussed. There is little evidence that they act mainly by stimulating the defence mechanisms of the body (McIntosh and Whitby 1939). It seems rather that they produce their effect chiefly by direct action on the bacterial cells, possibly by preventing the development, or bringing about the destruction, of the surface immunising antigens upon which the capacity to resist the defence mechanisms of the host appears largely to depend. This suggestion is supported by the fact that the capsules of pneumococci growing in vivo in the presence of M. & B. 693 appear to undergo degeneration and in later stages are no longer demonstrable (Telling and Oliver 1938).

This phenomenon however, as McIntosh and Whitby have pointed out, may be merely part of the degenerative process accompanying death of the organisms in vivo and not necessarily due to direct action of the drug on the bacterial cell. The results of tests in vitro and in vivo indicate that the drugs do not produce their effect by simple germicidal action, since there is a short lag period before they become effective, during which the organisms may multiply at their normal rate, or there may even be an initial stimulation of growth (Colebrook, Buttle and O'Meara 1936, Finklestone-Sayliss, Paine and Patrick 1937). It seems rather that the main action of the drugs is bacteriostatic, preventing the organisms from multiplying to their normal extent, by interference with their metabolic activities. This, it is suggested, may be brought about by inactivation of certain enzyme systems responsible for the breakdown of complex proteins. Evidence in favour of this view has been brought forward by Lockwood (1938) who has shown that the inhibition of growth of hæmolytic streptococci in serum by sulphanilamide is greatly decreased if a small amount of peptone is present. He suggests that sulphanilamide prevents the organisms from breaking down the complex serum proteins, but they are still able to utilise the simpler breakdown products of protein, such as peptone, as nutritive material. Attempts to demonstrate a direct action of the drugs on the metabolic activity of certain bacteria have not yet met with success (Mellon and Bambas 1937, Barron and Jacobs 1937).

In the present paper this theory has been investigated further and attempts have been made to determine whether substances other than peptone are antibacteriostatic. In preliminary experiments, employing small inocula of a highly sulphanilamide-sensitive group C strain of hæmolytic streptococcus, it was found that in media such as heart broth or Hartley broth relatively large amounts of peptone (1 per cent. or more) were required to produce any marked antibacteriostatic effect and the same result was obtained by enriching the medium with similar amounts of glucose or serum. It was also found that the addition to the medium of relatively small amounts of heat-killed bacterial cells of the homologous strain enabled small numbers of organisms to grow in dilutions of sulphanilamide normally producing complete inhibition—an effect similar to that produced, according to Lockwood, by peptone in serum. It seemed that the two effects might be brought about in the same way—namely, by the provision of favourable nutritive material. There was a further possibility however that the killed bacterial cells might produce their effect by supplying a sufficient concentration of a necessary enzyme factor which enables the organism to overcome the inhibitory action of the sulphanilamide.

It appeared that an explanation might be forthcoming if it were found possible to isolate from the bacterial cells the substance responsible for their antibacteriostatic activity, and submit it to chemical analysis. Accordingly attempts have been made to fractionate the bacteria in various ways and to test each fraction separately for its ability to overcome the bacteriostatic action of sulphanilamide and M. & B. 693 in different media.

EXPERIMENTAL

Fractions have been obtained from two different strains of hæmolytic streptococci by methods similar to those employed in the isolation of immunising fractions from hæmolytic streptococci (Stamp and Hendry 1937), involving extraction with dilute acids and alkalis.

The method of testing for antibacteriostatic activity consisted in incorporating a standard amount of each fraction in a series of tubes of medium containing varying dilutions of sulphanilamide or M. & B. 693. Each series of tubes together with a control set containing no fraction was then inoculated with a standard number of viable organisms, incubated and observed daily for the development of turbidity. With a suitably small inoculum, a degree of turbidity equal to that of a control sulphanilamide-free culture developed in the control series in the higher dilutions of the drug, while the tubes with the lower dilutions remained permanently clear. A similar effect was obtained with sets of dilutions containing some of the fractions tested, while with other fractions maximal turbidity rapidly developed in all dilutions, indicating that the fractions possessed antibacterio-

static activity An approximate indication as to the relative activity of different fractions has been obtained by determining the smallest amount of each required to produce maximal growth in all dilutions in a given time Another method employed in estimating the activity of different fractions has been to carry out daily viable counts on organisms growing in the presence of the fractions in suitable concentrations of the drug This method has of necessity been used on occasions when whole blood has constituted the test medium, but apart from such cases appears to have no advantage over the other method, besides being much more laborious

MATERIAL AND METHODS

Strains of hæmolytic streptococci —Strain "S 34" isolated from bovine mastitis, belonging to the *sorbitol-positive*, trehalose-negative subgroup of group C, has been used in the majority of tests It has been found to be very sensitive to the action of sulphanilamide and M & B 693 in vitro, but is only relatively slightly affected by the drugs in vivo Strain "Richards" isolated from puerperal septicæmia, belonging to group A, type 3, has also been employed on a number of occasions It has been found to be less sensitive than 'S 34 to the action of the drugs in vitro, though more sensitive than other group A strains tested It is however strongly inhibited in vivo

Size of inoculum —Preliminary tests with each strain were carried out employing inocula of varying size, to determine the maximum number of organisms that would grow out in high dilutions of the drug in different media while remaining permanently inhibited in the lower dilutions The most suitable inoculum of both strains for producing this effect was found to be approximately 1000 viable organisms (from an 18 hour Hartley-broth culture) in 5 c cm of medium Larger inocula (100 000 organisms or more) tended to grow out in the lowest dilutions employed, though the appearance of turbidity might be delayed for 24–48 hours or longer

Media —Hartley broth or heart broth has been employed in nearly all experiments Hartley broth has been prepared in the usual way by the tryptic digestion of horse muscle, and different batches have been found to possess an amino-N content of between 0 07 and 0 1 per cent as estimated by Sörensen's method of formol titration The inhibitory action of the drugs has been found to be fairly constant in repeated tests with the same batch of medium, but varied much more from one batch to another particularly with Hartley broth With one or two batches of this medium it has been found impossible to obtain permanent inhibition of growth in high concentrations of the drugs, even when very small inocula were used, the organisms tending to grow out after four or five days' incubation Excessive autoclaving in the preparation of the medium appeared to favour this effect It did not however seem more liable to occur in batches giving particularly luxuriant growth It was found advisable to avoid using such batches in testing different fractions, since though an indication was obtained as to relative antibacteriostatic activity, the results were not as clear-cut as when batches allowing a greater degree of inhibition of growth were used

Whole defibrinated human and rabbit blood have also been used in some tests With these media also it has rarely been found possible to obtain permanent inhibition of growth and in such cases reliance has been placed on the acceleration in the rate of growth produced by different fractions in estimating antibacteriostatic activity

Preparation of sets of dilutions of the drugs —500 mg of sulphanilamide or M & B 693 has been sterilised by autoclaving and dissolved in 500 c cm of medium A series of twelve dilutions from 1/1000 to 1/5 000,000 has been made up in the medium in 200 c cm amounts with aseptic precautions and transferred to sets of sterile ¾ in tubes in 4 5 c cm quantities

Method of testing fractions —A standard amount of each fraction or other substance to be tested contained in 0 5 c cm of saline or extract, was added to 4 5 c cm of each of the dilutions of drug In addition one set of dilutions received an equal amount of saline as a control The final dilutions of drug in each case have therefore been slightly greater than those indicated in the tables All tubes were then inoculated with approximately 1000 organisms and after shaking were incubated at 37° C Tubes were shaken daily and observed for the development of turbidity In the tables which follow the results recorded on each day during the first week have been set down in separate columns (+ = the development of a degree of turbidity equal to that of a control tube containing no drug, ± = intermediate degrees of turbidity, − = no visible growth, or in tests of acid extracts a slight turbidity similar to that of uninoculated control tubes) It was found that growth rarely developed in any tube after the first week Cultures were therefore discarded after 10–14 days' incubation

Very occasionally contaminants developed in certain tubes Usually they were easily recognised from their atypical growth In doubtful cases, cultures were plated out

METHOD OF ISOLATION OF FRACTIONS

The material for fractionation was prepared by growing strain "S.34" or strain "Richards" in 100 litres of Hartley broth for 24 hours at 37° C The bacterial cells were allowed to sediment at 0° C, the bulk of the supernatant broth was siphoned off, and the organisms were centrifuged down A small quantity of the supernatant broth was filtered and set aside for testing along with the fractions The deposited cells were resuspended in 300 c cm of distilled water and shaken for three hours at 37° C They were then recentrifuged and the supernatant washings were also filtered and set aside for testing After one more washing in distilled water the cells were resuspended in 600 c cm of distilled water and divided into two portions To one portion 2N HCl was added to give a final concentration of approximately N/25 HCl To the other portion 2N NH_4OH was added to give the same concentration of NH_4OH Each suspension was shaken at 37° C overnight and then centrifuged until the supernatants were almost clear They were then passed through Chamberland L3 filters and the filtrates were neutralised to pH 7 At this pH the HCl extract formed a dense precipitate A part of this extract was set aside for testing and the remainder was divided into two fractions by centrifuging The clear supernatant was removed and the precipitate redissolved in dilute acid After one reprecipitation it was redissolved in dilute HCl and neutralised

The filtered NH_4OH extract remained water clear on neutralisation A dense precipitate formed, however, on adjusting the pH to 4–5. A portion of the crude neutralised extract was set aside for testing, and the remainder fractionated by precipitation in this way The pH4 precipitate was reprecipitated once from solution in dilute NaOH, then redissolved in dilute NaOH and neutralised The clear supernatant at pH 4 was neutralised All manipulations were carried out as far as possible with aseptic precautions In the majority of fractionations no attempt was made to isolate the fractions in a solid state A rough estimate of the total amount of dissolved organic material present in each solution was obtained by precipitating an aliquot part with 9 volumes of alcohol, drying and weighing the precipitate, and also, in some cases, by taking an aliquot part down to dryness in vacuo over phosphorus pentoxide and weighing allowance being made for the weight of NH_4Cl calculated to be present Each solution was then diluted with saline, so as to contain between 100–200 mg per 100 c cm of dissolved organic material The addition

TABLE I—EFFECT OF WATER-SOLUBLE, HCL-SOLUBLE AND NH_4OH-SOLUBLE FRACTIONS ON THE GROWTH OF STRAIN "S.34" IN HEART BROTH WITH VARYING CONCENTRATIONS OF SULPHANILAMIDE

Dilution of drug	Control, no extract							Filtrate of 24-hr Hartley broth culture							Crude water-soluble fraction							Crude HCl-soluble fraction						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/2500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/5000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/10,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/25,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/50,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/100,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/250,000	−	−	−	−	−	−	−	−	−	+	+	+	+	+	−	−	−	+	+	+	+	−	−	−	+	+	+	+
1/500,000	−	−	−	−	−	−	−	±	±	+	+	+	+	+	±	+	+	+	+	+	+	−	−	+	+	+	+	+
1/1 × 10⁶	−	−	−	−	−	−	−	±	+	+	+	+	+	+	±	+	+	+	+	+	+	−	−	+	+	+	+	+
1/2 5 × 10⁶	−	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	±	+	+	+	+	+	+
1/5 × 10⁶	−	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Dilution of drug	Crude NH_4OH-soluble fraction							Precipitate at pH 4 of crude NH_4OH-soluble fraction							Supernatant at pH 4 of crude NH_4OH-soluble fraction							
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1/1000	−	−	+	+	+	+	+	−	−	−	−	−	−	−	−	+	+	+	+	+	+	
1/2500	−	±	+	+	+	+	+	−	−	−	−	−	−	−	−	+	+	+	+	+	+	
1/5000	−	±	+	+	+	+	+	−	−	−	−	−	−	−	−	+	+	+	+	+	+	
1/10,000	−	−	+	+	+	+	+	−	−	−	−	−	−	−	−	+	+	+	+	+	+	
1/25,000	−	−	+	+	+	+	+	−	−	−	−	−	−	−	−	+	+	+	+	+	+	
1/50,000	−	+	+	+	+	+	+	−	−	−	−	−	−	−	−	+	+	+	+	+	+	
1/100,000	−	−	+	+	+	+	+	−	−	−	−	−	−	−	−	+	+	+	+	+	+	
1/250,000	−	+	+	+	+	+	+	−	−	−	+	+	+	+	−	+	+	+	+	+	+	
1/500,000	−	+	+	+	+	+	+	±	+	+	+	+	+	+	−	+	+	+	+	+	+	
1/1 × 10⁶	−	+	+	+	+	+	+	±	+	+	+	+	+	+	−	+	+	+	+	+	+	
1/2 5 × 10⁶	+	+	+	+	+	+	+	+	+	+	+	+	+	+	±	+	+	+	+	+	+	
1/5 × 10⁶	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	

Tubes observed daily during the first week for visible signs of growth and the results recorded in columns 1–7.

+ = growth complete
± = intermediate degrees of turbidity
− = no visible growth

of 0·5 c.cm. quantities of these solutions to 4·5 c.cm. of medium resulted in a final concentration of 10–20 mg. per 100 c.cm.

ANTIBACTERIOSTATIC ACTIVITY OF DIFFERENT FRACTIONS

An investigation has been carried out of the effect of these fractions isolated from strain "S.34" on the inhibition of growth of the homologous strain in heart broth containing sulphanilamide, and the results are shown in table I.

It will be seen that the crude NH_4OH extract exerted a marked antibacteriostatic effect on sulphanilamide, growth being complete in all dilutions of the drug after 72 hours. A similar effect was obtained with the pH4-supernatant fraction of the NH_4OH extract. None of the other fractions have produced a result appreciably different from that of the control and have failed to support growth in all dilutions below 1/250,000. Control tests showed that the effect obtained was not due to the presence of NH_4Cl in the active extract. It appeared therefore that a substance capable of neutralising the inhibitory action of sulphanilamide in vitro might be isolated from the bacterial cells by extraction with NH_4OH, but not with dilute HCl. This substance was not present in an appreciable amount in a filtrate of the culture nor in an aqueous extract, and was not precipitated from the NH_4OH extract at pH 4. Essentially similar results have been obtained with

TABLE II—EFFECT OF HCL-SOLUBLE AND NH_4OH-SOLUBLE FRACTIONS ON THE GROWTH OF STRAIN "S 34" IN HARTLEY BROTH WITH VARYING CONCENTRATIONS OF SULPHANILAMIDE

Dilution of drug	Control, no extract							Crude NH_4OH-soluble fraction							Crude NH_4OH-soluble fraction, N/10 HCl treated							Crude HCl soluble fraction						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	±	+	+	+	+	+	−	−	−	−	−	−	−
1/2500	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	±	+	+	+	+	+	−	−	−	−	−	−	−
1/5000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	−	−	−	−	−	−
1/10,000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	−	−	−	−	−	−
1/25,000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	−	−	−	−	−	−
1/50,000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	−	−	−	−	−	−
1/100,000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	−	−	−	−	−	−
1/250,000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	−	−	−	−	−	−
1/500,000	−	−	+	+	+	+	+	+	+	+	+	+	+	+	±	+	+	+	+	+	+	−	−	−	+	+	+	+

Dilution of drug	Precipitate at pH 4 of NH_4OH-soluble fraction 10–20 mg *							Supernatant at pH 4 of NH_4OH-soluble fraction 10–20 mg *							Supernatant fraction 1–2 mg *							Supernatant fraction 0 1–0 2 mg *						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	−	−	−	−	−	−	−	−	±	+	+	+	+	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/2500	−	−	−	−	−	−	−	−	+	+	+	+	+	+	−	±	+	+	+	+	+	−	−	−	−	−	−	−
1/5000	−	−	−	−	−	−	−	−	+	+	+	+	+	+	−	±	+	+	+	+	+	−	−	−	−	−	−	−
1/10,000	−	−	−	−	−	−	−	−	+	+	+	+	+	+	−	±	+	+	+	+	+	−	−	−	−	−	−	−
1/25,000	−	−	−	−	−	−	−	−	+	+	+	+	+	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/50,000	−	−	−	−	−	−	−	−	+	+	+	+	+	+	−	±	+	+	+	+	+	−	−	−	−	−	−	−
1/100,000	−	−	−	−	−	−	−	−	+	+	+	+	+	+	−	+	+	+	+	+	+	−	−	−	−	−	−	−
1/250,000	−	−	−	−	−	−	+	−	+	+	+	+	+	+	−	+	+	+	+	+	+	−	−	−	−	−	−	−
1/500,000	−	±	+	+	+	+	+	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	−	+	+	+	+	+

* mg per 100 c cm

TABLE III—EFFECT OF THE NH_4OH SOLUBLE pH4 SUPERNATANT FRACTION OF "S 14," UNHEATED AND HEATED AT 100° C FOR 10 MINUTES AND IN DIFFERENT CONCENTRATIONS, ON THE BACTERIOSTATIC ACTION OF SULPHANILAMIDE IN HARTLEY BROTH

Dilution of drug	Control no extract							NH_4OH-soluble pH4-soluble fraction, unheated, 10–20 mg *							Unheated fraction 1–2 mg *							Heated fraction 1–2 mg *						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	±	+	+	+	+	+
1/2500	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	±	+	+	+	+	+
1/5000	−	−	−	−	−	+	+	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	±	+	+	+	+	+
1/10,000	−	−	−	−	−	+	+	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	±	+	+	+	+	+
1/25,000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	+	+	+	+	+	+	−	±	+	+	+	+	+
1/50,000	−	−	−	−	−	+	+	+	+	+	+	+	+	+	−	+	+	+	+	+	+	−	±	+	+	+	+	+
1/100,000	−	−	±	−	+	+	+	+	+	+	+	+	+	+	−	+	+	+	+	+	+	−	±	+	+	+	+	+
1/250,000	−	−	−	−	+	+	+	+	+	+	+	+	+	+	±	+	+	+	+	+	+	−	±	+	+	+	+	+
1/500 000	±	+	+	+	+	+	+	+	+	+	+	+	+	+	±	+	+	+	+	+	+	±	+	+	+	+	+	+
	Unheated fraction 0 1–0 2 mg *							Heated fraction 0 1–0 2 mg *							Unheated fraction 0 01–0·02 mg *							Heated fraction 0 01–0 02 mg *						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	−	−	−	−	+	+	+	−	−	−	+	+	+	+	−	−	−	−	−	+	+	−	−	−	−	±	+	+
1/2500	−	−	−	−	+	+	+	−	−	−	±	+	+	+	−	−	−	−	−	+	+	−	−	−	−	+	+	+
1/5000	−	−	±	−	+	+	+	−	−	−	±	+	+	+	−	−	−	+	+	+	+	−	−	−	−	+	+	+
1/10 000	−	−	+	−	+	+	+	−	−	−	±	+	+	+	−	−	−	±	+	+	+	−	−	−	−	+	+	+
1/25,000	−	−	−	−	+	+	+	−	−	−	±	+	+	+	−	−	−	−	±	+	+	−	−	−	−	±	+	+
1/50,000	−	−	+	−	+	+	+	−	−	−	±	+	+	+	−	−	−	±	+	+	+	−	−	−	−	+	+	+
1/100,000	−	−	+	−	+	+	+	−	−	−	±	+	+	+	−	−	−	+	+	+	+	−	−	−	±	+	+	+
1/250,000	−	−	+	−	+	+	+	−	−	−	±	+	+	+	−	−	−	+	+	+	+	−	−	−	+	+	+	+
1/500,000	±	+	+	+	+	+	+	±	+	+	+	+	+	+	±	+	+	+	+	+	+	−	±	+	+	+	+	+

* mg per 100 c cm

the active NH_4OH soluble fractions in Hartley broth containing varying dilutions of M & B 693

It was of interest to determine the concentration of the active fraction necessary to produce any effect and also whether it was possible to inactivate it by treatment with dilute HCl in order to account for the lack of activity of the HCl extract Another fractionation has therefore been carried out in the same way A portion of the crude NH_4OH soluble fraction was acidified to a concentration of N/10 HCl, allowed to stand overnight at 37° C, and then neutralised. This was tested in Hartley broth along with the other fractions including varying concentrations of the NH_4OH soluble pH4 supernatant fraction The batch of Hartley broth employed in this test permitted no growth of the standard inoculum in concentrations of the drug below 1/500,000 The results of this experiment are shown in table II It will be seen that the results obtained in the previous test have been confirmed. There is no indication that the activity of the crude NH_4OH extract was destroyed by treatment with N/10 HCl Further tests have confirmed this finding It seems likely therefore that the inactivity of the HCl extract is due to the fact that the active substance cannot be extracted from the bacterial cells by dilute acid. The NH_4OH-soluble pH4 supernatant fraction is shown to be active in this batch of medium in a concentration of 1–2 mg per 100 c cm, but produces no appreciable effect in a concentration of 0 1–0 2 mg

Varying concentrations of this active fraction have been tested in another batch of Hartley broth in which the inhibitory action of sulphanilamide was not as marked The effect of heat on the activity of the fraction has also been investigated by testing varying concentrations of the fraction previously heated at 100° C for ten minutes The results are shown in table III

It will be seen that in this batch of medium a concentration of the fraction as low as 0 01–0 02 mg per 100 c.cm had an appreciable anti inhibitory effect In this concentration, turbidity developed in all dilutions of the drug by the sixth day, while in the control series growth was permanently inhibited

TABLE IV—EFFECT OF DIFFERENT FRACTIONS ISOLATED FROM STRAIN "RICHARDS" ON THE BACTERIOSTATIC ACTION OF SULPHANILAMIDE IN HARTLEY BROTH

Dilution of drug	Control, no extract							Crude water soluble fraction							Crude HCl-soluble fraction						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/2500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	+	+	+	+	+
1/5000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/10,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/25,000	−	−	−	−	−	−	−	±	+	+	+	+	+	+	−	−	−	−	−	+	+
1/50,000	±	+	+	+	+	+	+	+	+	+	+	+	+	+	−	+	+	+	+	+	+
1/100,000	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Crude NH_4OH-soluble fraction							Precipitate at pH 4 of NH_4OH soluble fraction							Supernatant at pH 4 of NH_4OH-soluble fraction						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	±	+	+	+	+	+
1/2500	±	−	−	−	−	−	−	−	−	−	−	−	−	−	−	±	+	+	+	+	+
1/5000	+	+	+	+	+	+	+	−	−	−	−	−	−	−	−	+	+	+	+	+	+
1/10,000	+	+	+	+	+	+	+	−	−	−	−	−	−	−	−	±	+	+	+	+	+
1/25 000	+	+	+	+	+	+	+	+	+	+	+	+	+	+	−	+	+	+	+	+	+
1/50,000	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1/100 000	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

TABLE V—EFFECT OF THE NH_4OH-SOLUBLE pH4-SUPERNATANT FRACTIONS ISOLATED FROM "RICHARDS" AND "S 34" STRAINS ON THE GROWTH OF THESE ORGANISMS IN HARTLEY BROTH WITH VARYING CONCENTRATIONS OF SULPHANILAMIDE

Dilution of drug	Inoculated with—	Control, no extract							Fraction isolated from "Richards"							Fraction isolated from "S 34"						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	"Richards"	−	−	−	−	−	−	−	−	±	+	+	+	+	+	±	+	+	+	+	+	+
1/2500		−	−	−	−	−	−	−	−	±	+	+	+	+	+	±	+	+	+	+	+	+
1/5000		−	−	−	−	−	−	−	−	±	+	+	+	+	+	±	+	+	+	+	+	+
1/10,000		−	−	−	−	−	−	−	−	−	+	+	+	+	+	±	+	+	+	+	+	+
1/25,000		−	−	−	−	−	−	−	−	±	+	+	+	+	+	+	+	+	+	+	+	+
1/50,000		±	+	+	+	+	+	+	−	+	+	+	+	+	+	+	+	+	+	+	+	+
1/100,000		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1/250,000		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1/500,000		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1/1 × 10^6		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1/1000	"S 34"	−	−	−	−	−	−	−	±	+	+	+	+	+	+	±	+	+	+	+	+	+
1/2500		−	−	−	−	−	−	−	±	+	+	+	+	+	+	±	+	+	+	+	+	+
1/5000		−	−	−	−	−	−	−	±	+	+	+	+	+	+	±	+	+	+	+	+	+
1/10,000		−	−	−	−	−	−	−	±	+	+	+	+	+	+	±	+	+	+	+	+	+
1/25,000		−	−	−	−	−	−	−	+	+	+	+	+	+	+	±	+	+	+	+	+	+
1/50,000		±	+	+	+	+	+	+	+	+	+	+	+	+	+	±	+	+	+	+	+	+
1/100,000		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1/250,000		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1/500,000		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1/1 × 10^6		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

in several of the higher concentrations Furthermore the activity of the fraction was not appreciably affected by heating, the heated and unheated fractions producing very similar results in all concentrations employed

Fractions have also been isolated from strain "Richards" in the way already described and tested in Hartley broth with varying concentrations of sulphanilamide. The results shown in table IV indicate that an active fraction similar to that obtained from "S 34" may be isolated from this strain also It was of interest to determine whether these fractions were capable of stimulating the growth in sulphanilamide of the heterologous as well as the homologous strain Accordingly the activity of both NH_4OH-soluble pH4-supernatant fractions was tested with each strain The results shown in table V indicate that the action of the fraction is non-specific, the growth of the homologous and heterologous strains being promoted to a similar extent by each fraction. Tests of the "Richards" active fraction were also carried out in heart broth, but gave less consistent results In certain batches of this medium a higher concentration of the active fractions than that normally employed appears to be required to produce an appreciable antibacteriostatic effect.

FRACTIONATION OF THE NH_4OH-SOLUBLE pH4-SUPERNATANT FRACTION OF "S 34"

An attempt was made to fractionate the active fraction further and to isolate it in a solid state

The washed bacterial cells from 120 litres of Hartley broth culture of "S 34" were repeatedly extracted overnight at 37° C. with N/25 NH_4OH. The first two extracts containing the great bulk of extractable material were centrifuged, pooled and adjusted to pH 4. *The pH4-precipitate, together with a residue* of bacterial cells, was centrifuged down, leaving 900 c cm. of clear supernatant. This filtered with ease through an L3 candle and was neutralised. To 600 c cm. of the filtrate was added 1200 c.cm. of absolute alcohol. After standing overnight at 0° C., the precipitate which formed was centrifuged down, washed with absolute alcohol and ether and dried *in vacuo over phosphorus pentoxide*. The yield of this "67 P" fraction was approximately 2 per cent. of the whole NH_4OH-soluble pH4-supernatant fraction It appeared to consist mainly of material similar to the pH4-precipitate fraction.

To the supernatant with two volumes of alcohol a further seven volumes or 4200 c.cm. of absolute

TABLE VI—EFFECT OF DIFFERENT FRACTIONS ISOLATED FROM THE NH_4OH-SOLUBLE pH4-SUPERNATANT FRACTION OF "S 34," AND ALSO OF PEPTONE AND GLUCOSE ON THE BACTERIOSTATIC ACTIVITY OF SULPHANILAMIDE IN HARTLEY BROTH

Dilution of drug	Control, no fraction							Peptone 100 mg *							Glucose 100 mg *						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/2500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/5000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/10,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/25,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/50,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/100,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1/250,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

Dilution of drug	Fraction "67 P" 10 mg *							Fraction "90 P" 10 mg *							Fraction "90 S" 10 mg *						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1/1000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	+	+	+
1/2500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	±	+	+	+	+	+
1/5000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	±	+	+	+	+	+
1/10,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	±	+	+	+	+	+
1/25,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	±	+	+	+	+	+
1/50,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	±	+	+	+	+	+
1/100,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	+	+	+	+	+
1/250,000	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	+	+	+	+	+

* mg per 100 c cm

alcohol were added After standing overnight at 0° C, the precipitate which formed was centrifuged down, washed and dried off as before The yield of this "90 P" fraction was found to be approximately 20 per cent of the total The supernatant with nine volumes of alcohol was then taken down to dryness in vacuo and drying was completed over P_2O_5 (phosphorus pentoxide) This '90 S" fraction was found to contain approximately one quarter of its weight of NH_4Cl The total concentration of dissolved material other than NH_4Cl present in the pH4 supernatant fraction of the NH_4OH extract was approximately 600 mg per 100 c cm This represents a yield of between 5–10 per cent of the total weight of the unfractionated cells as compared with a yield of 10–20 per cent of the pH4-precipitate fraction These yields are however only approximate and appear to vary considerably with different batches of cells

The three fractions— 67 P, "90 P, ' and "90 S"— isolated from the crude NH_4OH soluble pH4 supernatant fraction have been tested for anti-sulphanilamide activity in Hartley broth in the usual way, in a concentration of 10 mg per 100 c cm, the solutions of the fractions being heated to 100° C for ten minutes to sterilise before incorporating in the medium Tests of peptone and glucose added to the medium in ten times this concentration have also been included in this experiment The results are shown in table VI

It will be seen that in this batch of medium sulphanilamide had a very marked inhibitory effect, the standard inoculum of approximately 1000 organisms failing to grow out in any of the dilutions employed in the control series A similar effect was obtained in all the other sets of dilutions except the series containing the '90 S' fraction This fraction appears to be strongly antibacteriostatic and allowed the organisms to grow out by the fourth day in all dilutions of the drug

INFLUENCE OF PEPTONE AND OF "S 34" FRACTIONS ON GROWTH OF "RICHARDS" IN WHOLE BLOOD CONTAINING M & B 693

Experiments have been carried out to determine whether the fraction '90 S" is capable of antagonising the effect of the drugs in whole blood as well as in broth media Tests with both "Richards" and "S 34" strains have shown that even when very small inocula consisting of approximately 10 organisms were employed in rabbit or human defibrinated blood containing either drug in a concentration of 1/5000, the organism nearly always grew out after a lag period of a few days An indication as to the activity of different fractions under these conditions has been obtained by determining the degree to which the fractions were capable of reducing this lag period Different fractions in varying concentrations contained in 0 5 c cm of saline have been added to 4 5 c cm quantities of human defibrinated blood containing M & B 693 in a concentration of 1/10,000, and these have been inoculated with approximately 10 organisms Cultures containing peptone and controls consisting only of blood with and without the drug were also included in the test The rate of growth in each culture was estimated by daily viable counts, the rapid viable counting method described by Miles and Misra (1938) being employed, and the results are shown in fig 1 It will be seen that in this test the fraction "90 S" produced an appreciable acceleration in the rate of growth of the organisms in a concentration as low as 1/1,000 000 A similar effect was produced by peptone but only when considerably larger amounts were present The acid extract, as on previous occasions, was completely inactive The results therefore with whole blood, though not as clear cut as in the previous experiment with Hartley broth, tend to confirm the view that fraction "90 S" contains the active factor

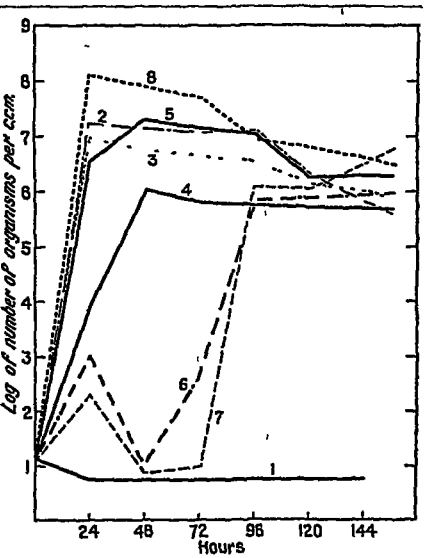

FIG 1—Showing the effect of different fractions isolated from streptococcus strain "S 34," and also of peptone, on the growth of strain "Richards" in defibrinated human blood containing M & B 693 in a concentration of 1 in 10,000

1 = Crude HCl soluble fraction (10 mg per 100 c cm)
2 = Fraction 90 S" (10 " " " ")
3 = " " (1 " " " ")
4 = " " (0 1 " " " ")
5 = Peptone (100 " " " ")
6 = (10 " " " ")
7 = Control No fraction
8 = " " No M & B 693

THE CHEMICAL PROPERTIES OF FRACTION "90 S"

By D BEALL, Ph D

This fraction is a hygroscopic amorphous yellow powder completely soluble in water After drying in vacuo nitrogen determinations were made by nesslerisation before and after Kjeldahl digestion, thus giving the ammonia nitrogen and total nitrogen of the samples The free amino acid content was determined by the colorimetric method of Folin Owing to the complexity of the mixture no attempt was made to obtain C and H figures but the ash content was estimated The amount of reducing sugar before and after acid hydrolysis was also found The figures obtained are given in table VII together with 'corrected values" on the assumption that all the ammonia nitrogen was present as ammonium chloride and also corrected for an ammonium chloride ash free basis

The combined reducing sugar was estimated by refluxing 28–36 mg samples for one hour with 5 c cm. N HCl exactly neutralising the excess acid with N NaOH and determining the liberated sugar by the Harding modification of the Schafer Hartmann method

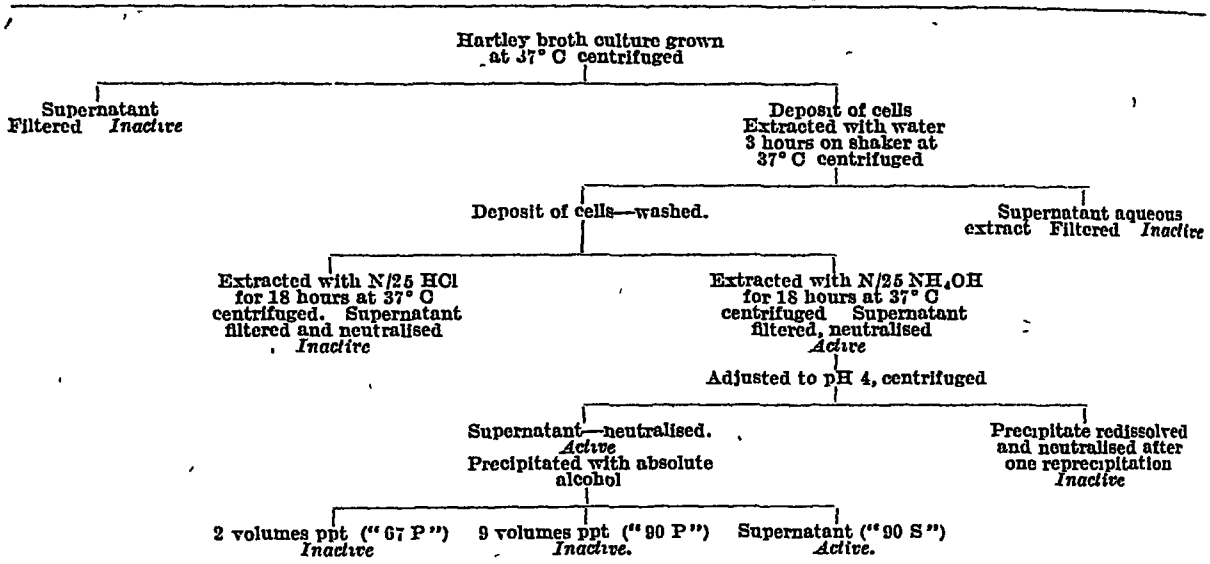
Hartley broth culture grown at 37° C centrifuged
Supernatant Filtered Inactive
Deposit of cells Extracted with water 3 hours on shaker at 37° C centrifuged
Deposit of cells—washed.
Supernatant aqueous extract Filtered Inactive
Extracted with N/25 HCl for 18 hours at 37° C centrifuged. Supernatant filtered and neutralised Inactive
Extracted with N/25 NH4OH for 18 hours at 37° C centrifuged Supernatant filtered, neutralised Active
Adjusted to pH 4, centrifuged
Supernatant—neutralised. Active
Precipitated with absolute alcohol
Precipitate redissolved and neutralised after one reprecipitation Inactive
2 volumes ppt ("67 P") Inactive
9 volumes ppt ("90 P") Inactive.
Supernatant ("90 S") Active.

FIG. 2—Method of isolation of fractions

In order to obtain further information about the form of the combined nitrogen, a number of qualitative tests were carried out using a 1 per cent. solution of the crude material It gave a positive xantho-proteic reaction and a very strong ninhydrin reaction. The modified Millon reaction (mercuric-nitrite test) and formaldehyde tryptophane reactions were negative. A negative biuret reaction was obtained even after allowing an N.NaOH solution to stand for

TABLE VII—ANALYSIS OF FRACTION "90 S"

—	Crude material (per cent)	Calculated values	
		NH_4Cl-free basis	NH_4Cl-ash free basis
Ammonia N . ..	7 1 (27 2 % NH_4Cl)	—	—
Total N .	16 1	12 4	14 3
Amino-acid N .	7 6	10 4	12 1
Ash	9 9	13 6	—
Free reducing sugar..	0	0	0
Reducing sugar after hydrolysis .	5 8	8 0	9·2

48 hours in a desiccator over sulphuric acid in order to remove the ammonia No precipitation occurred with trichloracetic acid, tannic acid, or sulphosalicylic acid. The Molisch reaction was positive.

DISCUSSION

The results of experiments recorded in this paper indicate that it is possible to isolate from broth cultures of hæmolytic streptococci a substance capable of antagonising the bacteriostatic action of sulphanilamide and M. & B. 693 in different media. The substance may be extracted from the bacterial cells by means of dilute NH_4OH, but is not removed in appreciable amounts by extraction with water or dilute HCl It is not precipitated from the ammoniacal extract on acidifying to a pH of 4–5, nor by the addition of nine volumes of alcohol (fig. 2) The activity of the substance is not affected by heating to 100° C and does not appear to be highly specific since it produces a growth-promoting effect in the presence of the drugs not only on the homologous strain but also on a strain belonging to a different serological group The substance is active in low concentrations, under favourable conditions exerting an appreciable effect in a dilution of 1 in a million, while a very marked effect has been obtained in nearly all experiments in a concentration of 1/10,000. A preliminary chemical analysis of the partially purified active substance indicates that it consists of material of relatively low molecular weight. It gives negative tests with various protein precipitants and also a negative biuret reaction A positive Molisch reaction and also estimations of the amount of reducing substance on hydrolysis show the presence of a small amount of carbohydrate material. A strongly positive ninhydrin reaction was obtained indicating the presence of free amino-acids The fraction also contains some 10 per cent of ash and about 25 per cent of NH_4Cl. It is evident that further purification and analysis of the active substance must be carried out before any definite indication can be obtained as to its real chemical nature and the way it produces its antibacteriostatic effect

There appear however to be several possible explanations of the results obtained in the present experiments, consistent with the view that the drugs exert an inhibitory influence on the activity of certain enzymes concerned in bacterial metabolism

In the first place the active fraction may contain a necessary nutritive factor, possibly an essential amino-acid, the production of which is interfered with by the action of the drugs This substance is unlikely to be one of the common simple amino-acids since a marked bacteriostatic effect can be obtained in a medium such as Hartley broth which contains a high concentration of these substances But it may be one of the rarer amino-acids which the organisms have to synthesise or even consist of a more complex molecule necessary for the synthesis of bacterial protein.

There is the further possibility that the active substance is an essential part of the enzyme system affected by the drugs It is unlikely that the activity of the fraction is due to the presence of the enzyme itself, since it is not affected by heating to 100° C nor by treatment with dilute acids and alkalis. It may be however that the activity of the drugs is

directed not against an actual enzyme but rather against a substance of the nature of a coenzyme upon the presence of which in many cases the activity of enzymes has been shown to be entirely dependent These substances are often relatively simple compounds of low molecular weight and are not infrequently resistant to treatment with heat, acids and alkalis The presence of such a substance in the active fraction might therefore be responsible for the effects produced It seems probable that the correct explanation of the antibacteriostatic activity of the fraction is to be found along these lines, but until further knowledge has been gained as to the chemical nature of the active factor it is impossible to give a definite answer to the problem

SUMMARY

1 A fraction capable of antagonising the bacteriostatic action of sulphanilamide and M & B 693 in vitro has been isolated from a broth culture of a group C haemolytic streptococcus

2 The fraction can be extracted from the bacterial cells by means of dilute NH_4OH but not with water or dilute HCl

3 The fraction is active in low concentrations and is resistant to heat, dilute acids and alkalis It appears to be non specific in its action

4 Preliminary chemical analysis indicates that the active fraction is free from protein and consists of a mixture of substances of relatively low molecular weight, including free amino acids

5 An apparently similar fraction has also been isolated from a culture of a group A haemolytic streptococcus

6 Possible ways in which this substance may produce its antibacteriostatic effect are discussed

I am greatly indebted to Dr D Beall who has very kindly carried out the chemical analysis on fraction "90 S" My thanks are also due to Mr F W Jelks for his invaluable technical assistance The general expenses connected with this investigation have been met by a specific grant from the Pilgrim Trust

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DISTURBANCE of MEMORY AFTER CONVULSION TREATMENT

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THE object of this paper is to report certain *undesirable effects* which have been noted after the administration of convulsants for the treatment of mental illness These effects may be described as "intellectual impairment," and were *observed* typically as defects in memory

The case material consists of a series of patients treated in the wards of the Maudsley Hospital during the six months March to August, 1938, most of these recovered and have been followed up to the present time The total number of cases treated during this period by the administration of the convulsants Cardiazol or Triazol was 37, but an accurate statistical survey of all these is unfortunately impossible, owing to the elimination of over half the number 6 patients left hospital after less than five injections, 6 patients did not improve or got clinically worse under treatment, and 9 patients were discharged without investigation of their intellectual capabilities by the detailed methods *presently to be mentioned* The remaining 16 patients, most of whom have been under the personal care of one of us (G T), formed the basis of the present investigation Of these, 12 were diagnosed as schizophrenic, and all but 1, who is still in hospital, improved sufficiently to return to work or household duties. Of the remaining 4 patients, 3 were *suffering from* depression of over eight months' duration, and 1 was in a severe obsessional state Of the depressives, 2 made considerable improvement and left hospital, 1 is still in hospital, complaining mainly of the memory defect to be discussed, and the obsessional is still attending in the outpatient department, only slightly improved. Table I gives a summary of the cases, diagnosis, treatment, and also results of the psychological investigation which is described in the latter part of the paper

TABLE I—SUMMARY OF CASES, TREATMENT, RESULTS AND MEMORY IMPAIRMENT

Case	Age	Diagnosis	Fits	Convulsant used	Average amount used (g.)	Result	Memory loss (noted)	Memory loss (tested)	Followed up
1	51	Dep	13	C	0·75	Rec	+++	+++	0
2	40	Schiz	13	C	0·62	Rec.	+++	+++	+
3	39	Dep	19	C	0·74	I P	++++	+++	+++
4	36	Schiz	12	C	0·73	Rec	0	++++	N T
5	*35*	*Schiz*	*8*	T	*0·5*	*Rec*	++++	N T	*Better*
6	35	Obses	7	C+I	1·0	Imp	++++	0	N T
7	35	Schiz	12	C	0·73	Rec	0	N T	N T
8	34	Dep	13	C+T	0·66	Rec	0	0	N T
9	33	Schiz	15	C+I	0·72	Rec	0	N T	N T
10	32	Schiz	13	C	1·2	Rec	+++	+	++
11	32	Schiz	15	C	0·7	I P	±	++	+
12	30	Schiz	13	C	0·82	Rec	+++	++++	++++
13	29	Schiz	13	C	0·66	Rec	+++	N T	N T
14	23	Schiz	15	C+T	2·0	Rec	0	+++	N T
15	21	Schiz	8	C+I	1·3	Rec	0	N T	N T
16	16	Schiz	5	C	1·3	Rec	0	0	N T

For purposes of comparison the doses of triazol have been given in terms of the equivalent quantity of cardiazol 0·01 g triazol being taken as equal to 0·5 g cardiazol C, cardiazol T, triazol I, insulin Dep depressive, Schiz schizophrenic, Obses, obsessional, Rec, recovered, I P inpatient at present, Imp, improved, ++++, certain impairment +++, almost certain impairment, ++, probable impairment +, possible impairment, 0, no impairment, N T, not tested

CASES ILLUSTRATING MEMORY LOSS

It will be seen from the table that of the 16 patients, 9 complained of memory difficulty The most striking

confirmation of this has come from the friends and relatives of the patients; in fact, attention was first drawn to the subject by the relatives of the second patient to be treated in hospital (no. 10, table I)

This patient developed an acute paranoid reaction, which progressed in hospital to a mixed schizophrenic state with catatonic features and a most florid symptomatology. After four weeks of treatment, consisting of ten convulsions, he lost most of his symptoms, and was able to go home for the weekend. There, according to his fiancée, he showed improvement, but seemed absent-minded, and had difficulty in recalling relatively unimportant matters connected with his daily life. Attention was first drawn to this deficiency on the second day, when, during conversation with some friends, he was unable to remember the name of the seaside resort where they had spent the previous afternoon. Questioning of the patient by his friends had revealed a number of other facts that he had forgotten, for instance, the name of the restaurant where they had lunched and what he had eaten; these facts were easily recalled once they had been mentioned. When last seen, eight months after treatment, he stated that it was still difficult to recall the names of people whom he had previously known quite well.

This patient also showed "lacunar amnesia," amounting to a retrograde amnesia, which covered the six weeks during which he had been most acutely ill, and the cardiazol injections had been started. This condition, which persisted for about three weeks, cleared up suddenly in three days. The amnesia can hardly be attributed to the treatment for the patient recovered from it in the course of treatment. Further, it was easily explicable on psychological grounds, as it was present at a stage of recovery when such unpleasant memories might well be suppressed.

Another case illustrating this memory difficulty is no. 5 in table I, a German refugee highly trained as a statistician and shorthand-typist. She had made a suicidal attempt during an acute paranoid psychosis, and when admitted to hospital was in a catatonic stupor. After eight convulsions induced with triazol, she made an apparently complete recovery from her attack, but started at once to complain that her memory, which had previously been exceptionally good, now played her tricks; on one occasion she was embarrassed by not being able to recall the name of a cousin whom she knew well, and who visited her in hospital. During the year preceding her illness she had learned English shorthand well enough to enable her to obtain a responsible secretarial post in this country. On recovery from her psychosis, five months after the onset, she had great difficulty in remembering this more recently acquired attainment. It had not, however, been completely forgotten, the defect involving only a certain number of signs which she had to relearn from the manual. In addition she showed some failure of retention: when she played tennis she could not retain the score during the game. This patient was discharged from hospital *ten weeks after the last injection* and has been interviewed three times in the six months since then. During this period, with characteristic German thoroughness, she retrained her memory by an elaborate system of self-imposed tasks, such as memorising and tabulating the contents of the shop windows of the town in which she was staying. When last seen she had obtained another position, and said that her memory gave her no more trouble Owing to her imperfect knowledge of English it was unfortunately impossible to assess the results of the standardised tests employing vocabulary on this patient

Another patient (no. 12, table I) came to the hospital for treatment of a rather insidious schizophrenia, which would ordinarily have been given a poor prognosis Treated with cardiazol, she had thirteen convulsions, and made considerable clinical improvement, but insisted on leaving rather than submit to further treatment. She has since been seen in the outpatient department. At the first visit, and subsequently, her husband complained more of her forgetfulness and impaired efficiency as a housewife than of her persisting psychotic symptoms, to which he was more accustomed. Before her illness this patient had been an obsessionally efficient housewife, but now she was always forgetting where she had put things, and complaining that she could not recall names and addresses of people whom she knew quite well Over a period of eight months since ceasing treatment her memory has improved both subjectively and objectively, but when last seen she said that she still had to use a list when shopping, as she could not yet rely on her memory.

Finally, no. 2 in table I is worthy of special note. This patient was admitted to hospital in what appeared to be a depressive state with obsessional features. During a period of two months under observation the purely affective side of her illness was to a large extent replaced by anxiety, and there were bizarre and fantastic delusions with auditory hallucinations In fact, the patient's condition at this time would qualify her for inclusion in the ill-defined group of "depressive states with schizophrenic features." Before the onset of her illness she had been a successful business woman; there had been no complaint of defective memory on admission, nor was this demonstrated in formal testing. Since the condition appeared to be stationary it was decided to use cardiazol, she was given thirteen convulsions and showed a fair degree of improvement. This patient, towards the end of her course of treatment (which she disliked intensely), had several episodes of acute excitement which came on twelve to twenty-four hours after the convulsion and which lasted from six to eight hours; during this time she was muddled and disorientated, and would do odd things, such as polishing the furniture with metal polish After recovery from each attack she would profess complete amnesia for the whole episode The treatment was finally discontinued at the patient's request, and she started almost at once to complain of memory difficulties Since these were, at first, mainly concerned with hospital matters, such as the names of patients and nurses, no great attention was paid to them. However, after her clinical state had almost returned to normal she found, when she was trying to pick up the threads of her business, that the names of customers and telephone numbers, which she had carried in her head for years, now eluded her Seen in the outpatient department over a period of eight months she said that this defect has gradually improved, but, on close questioning, it seems more probable that she has become able to compensate for a still existing deficiency. The test results bear out this impression

This patient further showed a very remarkable change . soon after the end of her treatment, when she came to interest herself in occupational therapy, she announced that she was no longer right- but left-handed. No great notice was taken of this statement at the time, as she was still far from well, but as she improved, it was found that she was using her left hand for things for which she had previously relied on her right. Now that she has been hard at work as a fur machinist for several months, she is gratified to find that she can get through a larger amount of work than formerly, as she is now ambidextrous. No neurological alterations were discovered to account for this phenomenon, the power in the right hand remaining unaffected It may be supposed that there had been some sinistrality before.

These brief records indicate the type of memory loss which may follow convulsant therapy. Such loss is not a typical accompaniment or sequel of either depressive or schizophrenic states, although patients recovering from a schizophrenic attack like those in a depressive illness may complain of difficulty

in concentration or may show retardation on testing (Weitbrecht 1938, Schmorl 1938) In our cases it was not present before treatment with convulsants There was no direct relationship between the severity of the psychosis and the degree of memory impairment noticed after treatment, nor was the age of the patient a significant factor The fact that these defects were in most cases noticed and reported by relatives before being complained of by the patient would seem to rule out the possibility of their being the result of suggestion As most cases in this series were given the same number of injections, it is not possible to say whether the number of convulsions affects the incidence of memory disturbances The quantity and type of convulsant used is unimportant from this point of view Not all the patients in the series complained of memory disability, and no impairment was demonstrable on testing in a certain number, thus shows that some patients were more liable than others to suffer damage after this type of treatment Possibly this difference is due to a relative inability of the vascular mechanism of some patients to withstand the sudden alterations in pressure caused by a convulsion The finer delimitation of this hypothetical group is being investigated

There is a similarity between the complaints of these patients and the memory disturbances that are so often seen after head injuries and in epileptics Disturbances of the Korsakow type described by Plattner (1938) as arising after cardiazol treatment were not observed in our group No human post-mortem material has as yet been reported on, but if lesions in the human brain are found, comparable to those observed in the brains of animals subjected to repeated cardiazol convulsions (Reitmann 1938, Dreszer and Scholz 1939), the existence of some organic intellectual impairment would not be at all surprising

DESCRIPTION OF TESTS

The test employed was a modification of the Babcock test for mental deterioration (Babcock 1930) It is based on the assumption that a person's mental level indicated by a vocabulary test is likely to be little affected by organic impairment, whereas his mental level indicated by tests which require the application and organisation of knowledge to meet relatively new situations may be greatly lessened When, therefore, there is a large discrepancy between his score in the two types of test, the vocabulary being, let us say, that of the normal adult, while the average mental level on the other tests is that of the normal child of eight, organic impairment is indicated whereas if he obtains the score of a normal child of eight on both the vocabulary and the other tests, original defect is indicated The test has, in fact, been used by Babcock and others in differentiating between mental deterioration and mental defect

Subsequent work (Simmins 1933, Wittman 1933) has confirmed the validity of the vocabulary score as an indicator of original mental level, except in very severe cases of organic impairment

When the test is given to schizophrenic and to manic depressive patients, very little difference is found between the patients' scores on the vocabulary and on the other tests The picture is hardly different from that of the normal person The test, therefore, cannot be used to differentiate between "functional" psychosis and normality Its main use appears to be as a relatively specific indicator of the presence of organic impairment, differentiating it on the one hand from original defect, and on the other from normality and functional psychosis

Confirmatory work has been presented by Gilbert (1935), who compared the scores of 185 people in the twenties with those of 175 people in the sixties The average score of the younger group on the vocabulary and on the other tests was identical, whereas that of the older group showed a difference of nearly five mental years in favour of the vocabulary test Furthermore, Gilbert found that within the sixty-year-old group there was a significant difference between the scores of those under and of those over sixty five, the difference being less in the younger patients, and pointing to a progressive deterioration within the decade

The Babcock test, which was devised in America, is presented as a "battery"—that is to say, each test within the battery has been standardised independently of the others over a wide range of mental ages It is not therefore necessary, when presenting the test, to use every item in the battery Clearly, the more items one uses the more reliable will be the final average score, but some of the tests require a reconstruction (and a consequent restandardisation) before they are used on English people The fact that each item has been independently standardised, however, enables one to dispense with these Furthermore, some patients get tired or otherwise less coöperative after about three quarters of an hour's testing Consequently, in the experiment about to be reported, only the following tests out of the battery were used —

1 Vocabulary	9 Digits reversed.
2 Days of the week (T)	10 Knox cubes
3 Months of the year (T)	11 Days of the week reversed (T)
4 Alphabet (T)	12 Months of the year reversed (T)
5 Digits forward	13 Memory for designs
6 Counting backwards from 20 to 1 (T)	14 Memory for sentences
7 Immediate memory for a paragraph	15 Giving opposites of words (T)
8 Woodworth Wells sub stitution test (T)	

Tests marked (T) are scored on a time basis

A further modification of Babcock's procedure was also employed The rote tests numbered 2, 3, and 4 are tests of original knowledge rather than of application of knowledge to new situations The average mental level in these three tests was therefore combined with the level in the vocabulary test, and the average of the two groups was taken as representing the original mental level. The average score on the remaining eleven tests was then compared with this

If, for example, a patient had a mental level of 17 years on the vocabulary test, and of 18, 18, and 16 years on the three rote tests numbered 2, 3, and 4 respectively, the average level on the rote tests was 17⅓ years This was combined with the level on the vocabulary test, and the average was then taken, giving a mental level of a fraction over 17 years This figure was taken as representing the patient's original mental level It will be seen that the procedure gives a greater value to the vocabulary test than to any single rote test The vocabulary test is, in fact, regarded as being of equal value to the three rote tests combined In this way the emphasis on the vocabulary test as an indicator of original mental level remains, but instead of having to depend entirely on this single measure one can add to its reliability by combining it with the average score on three other tests of early acquired knowledge

An additional advantage of this modification of Babcock's procedure was that some tests scored on a

time basis were included in the tests of original level. This helped to differentiate cases of simple retardation from those showing impairment, for in this modification timed and untimed tests appear both in the indicators of original level and in the indicators of present level.

In the results shown in tables II and III a comparison is made between the scores on the modified Babcock test, as described above, of four groups of patients:—

(1) Schizophrenics who recovered without insulin or cardiazol treatment.
(2) Treated general paralytics
(3) Epileptics (taken off sedative drugs for one week before testing).
(4) Patients treated with triazol or cardiazol.

No impairment was assumed when there was a difference of only 2 years or less between the tests

TABLE II—RESULT OF MODIFIED BABCOCK TEST BEFORE AND AFTER CONVULSION TREATMENT

—	Number in group	Original level (years)	Present level (years)	Result
Recovered schizophrenics	7	17½	16	No impairment
General paralytics	7	16	13	Impairment
Epileptics	9	12	8	Impairment
Cardiazol-treated patients	12	16½	13	Impairment

TABLE III—NUMBER OF PATIENTS IN EACH GROUP WHO SHOW IMPAIRMENT—I.E., THREE OR MORE YEARS' DIFFERENCE BETWEEN THE TWO GROUPS OF TESTS

—	No impairment	Impairment
Recovered schizophrenics ..	6	1
General paralytics	3	4
Epileptics	3	6
Cardiazol-treated patients ..	5	7

of original mental level and those of present mental level. A discrepancy of this order was regarded as lying within the margin of error of the test. If the difference was between 2 and 3 years, however, impairment was regarded as possible; if between 3 and 4 years, impairment was taken as probable; if between 4 and 5 years, impairment was almost certain; and if over 5 years, the impairment was regarded as quite certain.

The numbers are small, but the tables agree in showing similarity between the general paralytic, epileptic, and cardiazol-treated groups, and a difference between these three groups and that of the spontaneously recovered schizophrenics.

RETESTING THE CARDIAZOL-TREATED PATIENTS

Of the cardiazol-treated patients, 7 were retested with the same test between three and seven months after their treatment had been completed, and 4 then showed less impairment or no impairment at all. The other 3, however, showed as much impairment on the retest as they had on the earlier test, performed soon after their treatment had been completed. In 1 of these 3 cases the retest was given as much as seven months after the treatment had been completed, in the second it was given six months after, and in the third, four months after completion.

It may be noted that the same test was given on both occasions. If there were any practice effect it would tend to lower the degree of impairment indicated by the retest. The fact that 3 of the patients continued to show impairment on retesting is therefore the more significant. It would be improper to conclude that the damage is permanent, but the evidence shows that it is not evanescent or negligible.

SUMMARY AND CONCLUSIONS

Of 16 cases treated with convulsants—comprising 12 schizophrenics, 3 depressives and 1 obsessional—13 recovered and 3 improved. Of these, 9 complained of memory difficulties which they maintained were due to the treatment and which in 5 cases were still present six months after cessation of treatment. A test confirmed the impression of organic intellectual impairment in 8 of the patients, though 2 of these did not complain of any disability. Susceptibility to the effects of convulsions seems to vary, for 3 patients did not complain of impaired memory, nor did they show impairment on testing.

Although the implications of this work are rather grave, it is doubtful whether they out-balance the value of the treatment in selected cases. The risk of memory impairment suggests however that convulsants should not be employed, except as an extreme measure, in patients whose livelihood depends on their memory and purely intellectual capabilities

We wish to express our thanks to Prof. Edward Mapother for permission to work with patients under his care, and to Dr. A. J. Lewis for his criticisms and suggestions. One of us (J. M. B.) is indebted to the Medical Research Council for a part-time personal grant which enabled him to undertake this work.

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PAGET'S QUIET NECROSIS

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THE term "Paget's quiet necrosis," denoting a particular morbid process, has now almost passed from the realm of current usage Despite this, its description persists in modern surgical textbooks, and occasionally a candidate in a viva-voce examination is asked for his knowledge on the subject How far surgical authors have strayed from Paget's original description will be seen in the extracts selected from four modern and reputable volumes Though the subject is not of vast importance, an attempted clarification may be of help.

Paget's original lecture was given in *1869* before the Clinical Society of London and published in the *Transactions* in 1870. He described the condition of a female, aged 19, who had had pain in her knee for one month. There was an oval swelling about 6 in. long nearly surrounding the middle of the shaft of the femur. Hard pressure over the swelling was painful. Otherwise the shaft appeared healthy The patient was in the habit of breaking thick pieces of wood across her thigh. At no time was there any sign of fever. Operation was decided on, and a 6 in. incision was made over the outer part of the

thigh All the tissues down to the periosteum appeared perfectly healthy

"The periosteum was, in the portion, divided ½ to ¾ in thick and in all its thickness, dense, tough, white and moderately vascular Between the periosteum and the bone, the incision had laid open a flattened irregular cavity from which a little blood coloured fluid escaped, and was followed by the protrusion of some soft substance like coarse granulations *In this cavity which was from* ½ *to* 1½ *in* in diameter, was a thin rough sequestrum separated from the wall of the femur, about 1½ in long and ¼ in wide The walls of the cavity of which the outer was formed by the thickened periosteum and the inner by the hollowed out surface of the femur, felt smooth and velvety, as if covered by granulations, like those of ordinary cavities containing sequestra The sequestrum appeared to be divided, not from the outermost layers of the femur, but from layers just within them"

Paget's comment on the lesion is as follows "The central point of interest is I think, in the fact of necrosis leading to separation of a bone, being unattended with inflammation of any of the features external to the periosteum, and with no more than a scarcely discernible amount of suppuration around the sequestrum"

Lawford Knaggs makes the following points about the process —

(1) The sequestrum lies in a cavity surrounded by granulations but with a puzzling absence of suppuration

(2) The sequestrum appears to be derived from the layers just within the outer surface of the bone

(3) Both inner and outer surfaces of the sequestrum are eroded

(4) Separation of the sequestrum may not be complete at the ends

(5) The process may be extending at the extremities while the bulk of the sequestrum has separated

(6) The initial lesion is probably a mild staphylococcal periostitis which becomes limited

Paget's quiet necrosis is, therefore, a process of local necrosis and sequestrum formation in the superficial layers of the shaft of a long bone The lesion is chronic from the beginning and affects mainly young adults There is a minimal amount of suppuration surrounding the sequestrum, and sinuses are not formed It is probably the result of a chronic osteitis due to a rather non virulent staphylococcus

In 1875 Paget, unfortunately, complicated the picture by his essay on Quiet Necrosis, published in his book "Clinical Lectures and Essays" in which he described again his original case and commented on two similar cases He then suggested that by a similar process of 'quiet necrosis" the formation of some of the loose bodies in joints might be explained He wrote that some loose bodies "are portions of the proper articular cartilage with or without some adjacent bone, which have suffered a 'quiet necrosis,' and been exfoliated into the cavity of the joint" He suggested trauma as the primary factor, and that the portion of bone was killed by violence and exfoliated without suppuration

It is most probable that the lesion he was describing here was that now known as osteochondritis dissecans Separation takes place into the joint without suppuration, but the loose body is not a true sequestrum, because it lives We have not in the aetiology of the lesion, advanced very far beyond Paget's original suggestion that trauma was a factor

The following extracts from four modern surgical textbooks show the lack of unanimity of the authors and the confusion which may be caused in the mind of the reader

(1) After a description of the late results of trauma to a joint with infection resulting in acute suppurative arthritis, "Articular cartilage tends to total destruction from ingrowth of pannus, from autolysis by the toxins in the joint and, once the underlying bone is exposed, by stripping off in flakes Portions of the bone may die and form sequestra (Paget's Quiet Necrosis) whilst new bone is thrown out in other places"

(2) "Necrosis results from the following conditions (*a*) (*b*). (*b*) a variety, described by Sir James Paget under the name of quiet necrosis occurs as a result of direct injury, the sequestrum separating without suppuration It is one of the causes of loose bodies in joints and especially in the knee, following a blow on one of the condyles"

(3) Quiet necrosis "was described by Paget as a process of local necrosis and sequestrum formation of a chronic character occurring in young adults *It is probable that his cases* were examples of chronic osteomyelitis due to a rather non-virulent staphylococcus The pathological process of exfoliation of outgrowths of synovial fringes and cartilage into joints he considered similar but the two conditions appear to be in no way similar"

(4) "*Certain inflammatory bone formations may closely resemble osseous tumours although in the circumstances, the more diffuse character of the enlargement is likely to resemble an ossifying sarcoma* rather than a simple osteoma In this connexion the extraordinary deposit of new bone which may gradually occur round a small sequestrum is of great practical importance To this condition Paget applied the graphic name of 'quiet necrosis'"

The reader may judge the above extracts for himself in the light of Paget's original descriptions

SUMMARY

(1) Paget's quiet necrosis is a process, not a disease The process is one of local necrosis and sequestrum formation associated possibly with a traumatic factor

(2) According to his original description the process took place in the superficial layers of the shaft of a long bone of a young adult

(3) Suppuration is minimal, and sinuses are not formed

(4) Paget later suggested that by the same process a portion of articular cartilage might be exfoliated into a joint and produce a loose body This probably corresponds to the lesion which we now call osteochondritis dissecans

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"Be an anthropologist, Reeves Fish up a lot of facts, alleged on very doubtful authority, about primitive man—his marriage ceremonies, his burial customs, his system of land tenure Look at the whole mass of facts squint-eyed until you can see a theory in it Embrace the theory, trot out all the facts which support your theory, write a long appendix on all the facts which contradict your theory, showing them to be insignificant or irrelevant, and there you are

"Is there any money in it?

"No If you're out for that, I should take to psycho analysis The system's the same, generally speaking, only *instead of dealing with primitive man, whom* you can disregard because he isn't there, you are dealing with a living man, who will probably tell you that you are a liar Then you tell him that he is losing his temper, which is the sign of a strong inhibition somewhere, and that's just what you were saying all along The beauty of psycho analysis is that it's 'Heads I win-and tails you lose' In medicine your diagnosis of fever is a trifle disconcerted if the patient's temperature is subnormal In psycho analysis you say, 'Ah, that just proves what I was saying'"—HOWARD A KNOX, 'The Viaduct Si (London, 1939)

MEDICAL SOCIETIES

MEDICO-LEGAL SOCIETY

AT a meeting of this society on June 22, with Dr. G. ROCHE LYNCH, the president, in the chair, a discussion on

The Psychiatric Handling of Delinquents

was opened by Dr DENIS CARROLL He said that psychiatric advice should not be given without a careful study of the offender under suitable conditions. The selection in court of suitable offenders for investigation was difficult even for a psychiatrist. The presence of a psychiatrist in court, and more systematic instruction of magistrates and probation officers, offered a possible solution It would not be practicable to employ a psychiatrist in every court, and, generally speaking, the selection must be made at once, as not all offenders could be remanded. As research indicated the necessary diagnostic criteria it might be possible to mark certain obvious types of offenders as worth routine remand, so that the probation officer might obtain data to define the need for medical investigation. Some groups might even be found worthy of routine medical examination—e g , drug-addicts, young chronic alcoholics and some sexual offenders The provision of the Criminal Justice Bill which allowed the question of the mental treatment of an offender on probation to be raised at any time during the first three months of the period might provide a solution in many cases.

Dr. Carroll described the psychiatric investigation, which is usually carried out by a team consisting of psychiatrists, psychologists and specially trained social workers The psychiatrist conducts a full mental examination, and either he or a general physician examines the offender physically. The psychologist, often a non-medical expert, estimates intelligence and ability for certain types of work by a carefully constructed set of tests The social worker obtains a full history of the offender's past life, environment, family and other circumstances, visiting the relatives and friends Dr. Carroll said that much of this work could be done by the probation officer if properly trained, but he would find it difficult to give the necessary time The ideal is to employ a social worker who has been a probation officer An hour each for the doctor and psychologist and two hours for the social worker is usually long enough There is serious lack of provision for inpatient observation , special centres, both official and non-official, are required The bill will help by empowering the local authorities to set up, or subscribe to voluntary bodies setting up, certain types of observation and treatment centres Some offenders object to repeated visits for investigation, and difficulties arise when the offender has to be accompanied to the clinic In practice these difficulties are handled successfully by obvious modifications of the investigation and by tact. Some of the difficulties would be eased if the non-attenders and objectors were remanded in custody or for inpatient observation, but it is not always possible to know when troubles will arise. They are usually due to the deep-seated hostile or persecutory attitude of mind characteristic of certain types of delinquents

After the investigation a report is sent to the court embodying the important findings, explaining their relation to the offence, and suggesting what should be done by way of treatment—where it could be carried out, the need for supervision, and so on If possible some forecast of the future is included. The general treatment is that of the causes, which are multiple and can be grouped under the heads of clinical, sociological and psychopathological The clinical state includes such factors as organic or mental disease, the degree of intelligence, pathological personalities, emotional stress, and habit of crime Sociological factors include bad or broken homes, bad companions, unsuitable work or occupation, economic stress and temptation. They are apt to be given too much importance, for they produce delinquent behaviour only in a person otherwise predisposed Psychopathology includes all the underlying mental processes, some of which may produce delinquent behaviour in so-called normal types The various theories can be turned to direct account in prescribing and carrying out useful treatment Many of the mental mechanisms prescribed by the freudian school are widely used by non-freudian psychiatrists in treating delinquents Psychoanalysis of offenders should be carried out only by trained analysts, and the theoretical teaching of the various schools of thought should be applied only to those cases where it is known to be of value.

When advising or supervising sociological measures, Dr. Carroll continued, the psychiatrist should bear in mind any contributory factor the persistence of which is likely to result in further delinquency. Several methods may have to be employed at the same time and several people may be involved, and it is highly important to maintain contact between them. A good social worker is invaluable and can carry out much of the necessary treatment of parents and others Treatment must be adequate, and training or supervision must be thought of in terms of years rather than months. It is important to obtain full knowledge about any place to which the offender is sent, for success depends largely on the personnel of the institution or foster-parent Training implies general character training and the development of a sense of social responsibility, as well as training in some form of employment Of psychological methods, suggestion is of more use with juvenile offenders than with adults Re-education is especially valuable in milder personality deviations Some workers favour moral education, especially for normal offenders Persuasion is a useful weapon with the intelligent and weak type Probation work is very encouraging ; there is no difficulty in combining it with other methods, even intensive psychotherapy. The criterion of whether psychotherapy should be used is whether the emotional state which has developed calls for such special skill to resolve it

The outlook for people who have committed isolated or accidental offences is good unless they are clumsily handled, but a delinquent habit is very difficult to eradicate. The younger the offender the better the prospect The environment may be so bad that nothing short of segregation is any use The attitude of the offender to society is always a mixture of friendly and unfriendly feeling, and the greater the capacity for forming positive transferences to the outside world the better the prognosis The effect of punishment is not easy to forecast. In some types it is disastrous, and the serious juvenile offender is generally better treated without it. There is scope for the application of common sense. Many cases can be dealt with simply and rapidly, but the psychiatrist does not often see these—a tribute to those who select his cases

DISCUSSION

Dr NORWOOD EAST said that of 2311 offenders placed on probation within his knowledge, 70 per cent did not commit an indictable offence in the next three years Of 438 persons who had already committed an offence when placed on probation, 54 per cent did not commit a further offence for three years In about 70 per cent of cases ordinary penal methods contributed to success—a far better result than any claimed by psychotherapy Petty-sessional courts heard about 90 per cent of all charges in this country crime is not a menace but merely a nuisance Psychiatric treatment includes general medical treatment, and much can be done by diet and drugs, occupation and good companionship, and regulation of the daily routine There is nothing to hinder the prisoner from receiving necessary psycho therapy from the prison medical officer Most sexual offenders have a fixed habit of delinquency and are unwilling to be reformed Nevertheless, even if psychiatric treatment is not successful it may be useful in providing data for research into the fundamental basis of crime, especially of abnormal crime In adult cases investigation is more useful than treatment

Dr ALEXANDER BALDIE complained that psycho therapists are in some quarters rather improperly regarded as mystics and supernaturals The "court psychiatrist" does not yet exist A psychiatric observer or assessor, he said, would be of the greatest value not only to the court, but also to the hard worked prison officer and to others who are dealing with the disposal as well as the treatment of the offender It is deplorable that in the London courts, the stipendiaries of which are unequalled for their competence, so many offenders with pronounced psychopathic traits should go through the machinery of trial and disposal with their condition unrecognised through lack of means to bring it to the court's attention It would greatly assist the court in determining factors mitigating the offence if these psychopathic traits could be recognised

Dr J C M MATHESON declared that on the evidence of the figures the problem is not so great as might at first sight appear He doubted whether psychiatrists have passed the student stage and are yet able to recommend treatment for delinquency Perhaps the present suggestions are to a certain extent tentative The public should be told that very little is yet known, and that psychiatrists are still groping their way Progress would better be made by approaching the problem as students rather than as therapists The psychiatric adviser to the court might usefully bring to the court's notice certain abnormal features in persons charged

REVIEWS AND NOTICES OF BOOKS

The Englishman's Food

Five Centuries of English Diet By J C DRUMMOND, D Sc Lond professor of biochemistry, University College, London, and ANNE WILBRAHAM London Jonathan Cape 1939 Pp 571 12s 6d

THIS well printed and illustrated book makes fine confused feeding, as Dr Johnson is reputed to have said of the haggis It is a book more to be dipped into or browsed on than read straight through—it would make a fine bedside book for a dietitian The authors have spread their net wide and taken in poetry, political pamphlets, medical treatises, diaries, estate accounts, novels, herbals, and books on husbandry and gardening in their quest for evidence of what England has eaten down the ages The study is fascinating, though the reader may at times weary of the digressions and the sudden jump from topic to topic and from century to century The book would have been better if it could have been compressed and kept more chronological None the less it will be a rich delving ground for all interested in dietetics for years to come

The authors bring out how surprisingly slowly new foods make their way into a country, although no Elizabethan would recognise half the foods that we eat today The medieval garden had no fruits but apples, cherries and plums, if we except the grape of the monastic vineyard, and few vegetables except garlic, onion and leek. Fruits were not thought wholesome till 1750 Potatoes were introduced in late Elizabethan days but medical opinion was against them, and they did not appear in books on gardening till 1726 and were not taken up by the Board of Agriculture till 1700 Bananas were actually introduced into this country in the eighteenth century but were not a common article of food till the beginning of the twentieth Why then were deficiency diseases not rife? The answer is that they were Scurvy was a common disease in spite though by 1597 cresses and lemons were [illegible] as specifics, and Culpeper says that parsley and strawberries are "good to fasten loose teeth" There is evidence that vitamin A was deficient, for night-blindness and stone in the kidney and bladder were common Rickets too was rife in the Low Countries and North Germany in the fifteenth century, and sixteenth century painters showed the holy infant as a rickety baby

We see here what a debt this country owes to religious and political refugees in the importation of new foods, particularly from Holland. Royal marriages acted in the same direction. On the other hand, snobbery, or the desire to imitate the upper classes, militated as it still does against the adoption or retention of a sound diet. The last two chapters, called "The War" and "A New Era," will stimulate those who think nutrition the foundation of the national health to press forward their demands for a consistent and progressive Government food policy both in war and peace In five centuries our food has made great advances, but it is by no means satisfactory yet If this book shakes the complacency of the [illegible] proportion of the higher ranks of administrative officials" it will have done good.

"every gradation from absolute certainty through practical assurance down to faint possibility."

Dr. Spicer of Minnesota set out to study the literature of the traumatic factor in disease, a subject which he thinks has been rather neglected in the standard textbooks, and he presents a formidable bibliography, but he shows an indifferent critical faculty in extracting his material. In fact, he seems to have sought authority for asserting that almost every imaginable disease may be due to, or at least aggravated by, injury. The case-histories he quotes are often interesting but their evidential value is sometimes flimsy in the extreme For instance, a man sustained an electric shock, after which "the nurse . . . states . . . that the pulse was markedly irregular and rapid. The man apparently made a complete recovery." On this evidence Dr. Spicer concludes that electric shock may cause auricular fibrillation.

This mass of material was not collected without great industry on the part of the author, and it seems a pity that more discrimination was not used in its presentation.

Crystalline Enzymes

The Chemistry of Pepsin, Trypsin and Bacteriophage. By JOHN H. NORTHROP, member of the Rockefeller Institute for Medical Research. New York: Columbia University Press. 1939. Pp. 176. 15*s*.

THIS is a valuable book, for the author has been associated with the crystallisation of enzymes from its earliest days, and he has made a full review of the whole field of study. He gives a detailed description of the crystallisation of trypsin, chymo-trypsin, pepsin, pepsinogen and the various peptidases Hitherto most of this material has had to be sought for in the German literature or in the original papers of Northrop himself and various other American writers. It is here set out conveniently and concisely, with a full bibliography and an excellent index.

Diagnosis and Treatment of Diseases of the Thyroid

By JAMES H. MEANS, M.D., Jackson professor of clinical medicine, Harvard University; and EDWARD P. RICHARDSON, M.D., John Homans professor of surgery in the university. London: Humphrey Milford, Oxford University Press. 1939. Pp. 367. 21*s*.

THIS volume of reprints from the Oxford Monographs on Diagnosis and Treatment contains much of value to both physician and surgeon. After a chapter on the historical aspects of our knowledge of the thyroid gland, there are useful summaries of the function and diseases of the gland, and of the principles of diagnosis and treatment. The classification is not always clear. Diffuse non-toxic goitre is discussed under colloid goitre, and diffuse toxic goitre and nodular toxic goitre are treated as two distinct conditions, under exophthalmic and adenomatous goitre, in spite of the statement in the text that true neoplasms or adenomata are not always present in the latter The diagnosis and treatment of these conditions are dealt with systematically, but the rarer complications, such as exophthalmic ophthalmoplegia, postoperative exophthalmos, osteoporosis and so on, receive little attention Myxœdema is considered thoroughly, but the varying grades of hypothyroidism are ignored. Throughout the book there are excellent illustrative case-reports showing the results of treatment, but more definite guides to ultimate prognosis would be welcome. If the reader expects, as he well might from such authorities as these, a discussion on the recent advances in knowledge of the physiology and functional pathology of the thyroid, he will be disappointed. But he will find the book an admirable practical guide to diagnosis and treatment.

Bacterial Metabolism

(*2nd ed.*) By MARJORY STEPHENSON, Sc D., associate of Newnham College, Cambridge; member of the scientific staff of the Medical Research Council. London: Longmans, Green and Co. 1939. Pp. 391. 21*s*.

THIS monograph first published in 1928 has doubled its size, and appears now as "an advanced textbook." The treatment of the subjects is amplified; important additions concern bacterial growth and nutrition, bacterial enzyme systems, nitrogen fixation and the newly opened field of bacterial photosynthesis. The metabolic activities of bacteria are of moment in a great deal of medical, industrial and agricultural bacteriology, but from the vast range of phenomena in these fields the author has selected only those that can profitably be discussed in the light of modern biochemistry. For this reason the textbook will probably be more useful to advanced biochemists than to bacteriologists Facts are for the most part allowed to speak for themselves, and there are few concessions to the uninstructed In scope the book has the stature of a textbook; in presentation it has not advanced sufficiently beyond the monograph written for experts Nevertheless, the medical bacteriologist will find it a mine of digested and documented information, and, what is perhaps more useful, a graveyard of a number of doubtful hypotheses.

Our chief complaint is of the paucity of general comment, which is the more regrettable because Dr. Stephenson is highly illuminating on the rare occasions when she allows herself something more than a rigidly ad-hoc criticism of her material. The book avoids being a series of detached essays on different aspects of bacterial metabolism by a process of historical dove-tailing, but little evidence of any general attitude to the subject is allowed to emerge unless it be a conviction that empiric bacteriology is to be regarded merely as an addition to the complexity of nature. Perhaps the subject is scarcely ripe enough for generalisation. At any rate, until Dr. Stephenson thinks that it is, we must be content with this excellent interim report.

Penn'orth of Chips

Backward Children in the Making. By CHARLES S. SEGAL. London: Victor Gollancz. 1939. Pp 128. 3*s*. 6*d*

DESPITE the title this book is a serious contribution to social science. It gives the results of Mr. Segal's own experiment—the detailed examination of the environment of 26 boys in a backward class. The observation that dullness and poverty are closely associated is strikingly illustrated. Mr. Segal does not, however, confine himself to the task of demonstrating that these two evils are associated; he is at pains to show to what a large extent poverty must be considered the cause of dullness. In doing this the whole body of evidence is taken in review and the opinions of dietitians, psychologists, social workers and others who have devoted time and labour to the subject are freely quoted. The book in fact, though not large, is a compendium of information of interest to doctors as well as laymen. There is a valuable preface by Dr. Cyril Burt.

THE LANCET

LONDON SATURDAY, JULY 1, 1939

FUNDAMENTAL CANCER RESEARCH

ON Tuesday afternoon the new laboratories of the Imperial Cancer Research Fund at Mill Hill were formally opened, within a stone's throw of the new central institute of the Medical Research Council In an address, with which he made the occasion additionally memorable (see p 33), Sir Gowland Hopkins recalls the confusion and pessimism in the medical profession on the subject of cancer which prevailed when the fund was established in 1902 Now the fund has a scientific tradition based on nearly forty years of research by a laboratory staff organised with far-seeing wisdom as a working unit Under the direction of Bashford and Murray this unit has laid stepping-stones in the systematic study of cancer by experimental means Galling as must have been the straitness of its accommodation in Queen Square to the personnel, Dr Gye will recognise the advantage of having waited for a worthier home until the needs of research were well established and the means available to equip an institute capable of supplying them It was certainly time for the fund to do something for its own staff, for there are few laboratories in Great Britain which have not depended for scientific material upon its generosity

The suggestion to found an institute for the investigation of the nature, cause and treatment of cancer originated (as the late Sir Frederic Hallett tells us in the first report of the fund) in 1901 "in some conversation between a private gentleman and a member of the council of the Royal College of Surgeons of England" Sufficient funds were quickly collected to enable investigations to be started, and the new organisation was placed under the joint control of the Royal Colleges of Physicians and Surgeons From the start it was realised that before ever the experimental study of cancer could, with profit and with hope of carrying conviction, be inaugurated it was necessary to gain a conception of the extent and distribution of cancer, and to clear the ground of the dogmas that cancer was a disease limited to civilised man and that it was increasing at an alarming rate Accordingly, with the help of Dr John Tatham of the General Register Office and of the large London hospitals, an examination of the statistics of cancer was undertaken Arrangements were made with the hospitals to check the accuracy of the diagnosis of cancer in a series of 10,000 cases according to the accessibility or inaccessibility of the site of the tumour, and when this was done a striking difference came to light In the accessible sites only 9 per cent had not been recognised clinically, while 7 per cent had been erroneously diagnosed as cancer In the inaccessible sites the percentage of missed diagnoses was as high as 38, while only 9 per cent of cases had been erroneously diagnosed as cancer Similar investigations in the United States and on the Continent have since had similar results Even under conditions most advantageous for diagnosis the number of cancer cases not recognised is surprisingly high for the inaccessible sites, since these are responsible for a large fraction of the whole cancer mortality, the recorded total must be sensibly lower than the actual one When therefore a comparison of the total recorded mortality is made over long periods, we must expect the improvements in methods of diagnosis, and the greater attention paid in recent times to the clinical recognition of cancer, to diminish the number of missed diagnoses and thus increase the recorded mortality If this argument is correct the increase in mortality will be found to fall mainly upon the inaccessible sites—and a glance at the Registrar-General's reports since 1901 proves this to be so Up to the beginning of this century the official figures were not sufficiently detailed to admit of a comparison between accessible and inaccessible sites By arrangement with Dr Tatham provision was made for a more detailed analysis, and in the report for 1903 the cancer cases were classified according to sex, age and parts affected "The arrangement of this column," it was stated in a footnote, "has been fixed after consultation with Dr E F Bashford, director of the Imperial Cancer Research Fund" Thus it was established that cancer is not increasing at an alarming rate in civilised communities and for this contribution to our knowledge we have to thank the fund

During this time the fund, with the generous help of Joseph Chamberlain, was making inquiries about the existence of cancer among the primitive races of the British Empire It was found that almost every kind of cancer known in civilised countries could be duplicated among peoples scarcely touched by what is called civilisation This put an end to another of the dogmas which was inhibiting a rational investigation of cancer A third belief widely held was that cancer is rare in animals, but it is a characteristic of cancer that it is uncommon in the younger age groups, and Bashford found that when animals were allowed to complete their normal span of life cancer was often observed The most satisfactory animal for this purpose is the mouse, being short-lived and kept easily in large numbers It was found possible to establish mouse data, of greater accuracy than human statistics, which showed a cancer incidence rising with increasing age just as in man. Up to 1900 no single cancerous mouse had been found in this country, before the fund had been in existence many years, over 1000 cases of cancer in mice had been observed and diagnosed microscopically With veterinary help the search was extended to all domesticated animals, when cancer was found wherever it was looked for properly. "Cancer," remarked Bashford in his second report, "has been discovered to pervade the whole vertebrate kingdom."

The experimental study of cancer on a broad basis now became possible, it was certain that observations on cancer in animals have relevance to cancer in man. The age-incidence, the mode of origin, the structural characters, the manner of growth and dissemination through the body, and the almost invariably fatal ending were found to be the same throughout the animal kingdom. In no other disease in fact is there such close identity as between cancer in man and cancer in animals. All subsequent experience has verified these early findings of the Imperial Cancer Research Fund. They are now buried in the body of our knowledge of cancer and it is right that they should be recalled at this moment in the fund's history. Since those early days great progress has been made Carcinogenic substances have provided the opportunity to study the inception of cancer; refinements of biochemical technique now enable the chemist to measure the metabolism of the malignant cell; and the discovery of virus tumours by Peyton Rous has given the hope that the discovery of the proximate cause of cancer is not beyond the wit of man. In all these advances the fund has played its part and whatever direction cancer research may take in the future will be profoundly influenced by the work which the fund has already accomplished. The courage and the initiative are there; those who wish the fund well will be content to leave its intellectual freedom completely unfettered.

THE DECLINE IN FERTILITY

THE prospects of a fall in our population, which are causing perhaps too much concern in some quarters and not enough in others, were discussed at length in the House of Lords on June 21. Lord SAMUEL set out the grounds on which the familiar hypothetical estimates have been made and painted a dismal picture of the economic and strategic results that must follow if the estimators prove true prophets. The immediate cause, he said, is no physiological change in the human race but deliberate conscious human action—children are not born because prospective parents do not wish them to be born. The primary cause is largely economic—namely, poverty or the fear of poverty, and consideration of the nutritional, educational and general interests of the children already born. He set no value on treatment of the immediate cause, but, backed by Lord DAWSON, Lord DERWENT and the ARCHBISHOP OF YORK, demanded treatment of the primary disease, by the institution of family allowances. Lord DAWSON put forward, too, the need for parental educational measures to allay the fears of maternity and bring home to mothers and fathers the ultimate wisdom of larger families. Lord SAMUEL and those who came after urged the Government to set up a Royal Commission on fertility, but Lord STAMP, and later Lord TEMPLEMORE for the Government, pointed out that such a commission would have few real data to work on.

The Population (Statistics) Act, which came into force a year ago, will elicit much about human fertility, but many problems outside the scope of figures will remain. Vital statistics, for instance, may tell us what proportion of women who die are childless and how many have had children, but they will tell us nothing of the factors responsible for sterile marriages and little of the influences which induce married couples to restrict their families. A proportion of marriages, we will learn, are sterile. What proportion of these are childless involuntarily or by design? The information obtained by registrars of births, marriages and deaths will throw no light on these intimate questions. In the complex of influences and experiences which deter from parenthood, medical factors play a definite, though as yet unascertained, part. It may be impossible to consummate a marriage owing to various causes affecting both sexes: varying degrees of sterility may be present in either parent, the woman may have had a number of miscarriages or stillbirths; she may suffer from one of many physical abnormalities or chronic illnesses which make pregnancy dangerous or incapacitate her from devoting proper care to her children in their early years, the father's bad health may weaken his earning power or cause misgivings as to his occupational stability, thus taking shape as an economic deterrent from parenthood; lastly, though physically and economically equipped for having children, the couple may hesitate to embark on parenthood because of hereditary defects (real or imaginary) in their ancestries.

The prevalence and importance of such factors as these can only be elucidated by direct inquiry. On another page appears a letter from representatives of the Population Investigation Committee, asking the cooperation of our profession in an inquiry which will bring out facts, on these and other matters, to take the place of the present guesswork. They should meet with a ready response.

WHY FLOGGING SHOULD BE ABOLISHED

PARLIAMENTARY voting on the proposal for the abolition of corporal punishment by order of a court is, we understand, to be treated as a non-party matter, and discussion has been sufficient for current arguments for and against it to be clearly defined. The report of the Departmental Committee on Corporal Punishment provides decisive evidence disproving the assumption that such punishment has any deterrent effect upon the person punished, and some evidence pointing to the likelihood that it has an opposite result. The supposed deterrent effect upon would-be criminals is incapable of such close examination, but oft-quoted positive claims in that direction did not survive statistical inquiry by the committee. It seems, therefore, that there is enough material in the report, when studied as a reasoned statement of cause and effect, to enable our legislators easily to reach a conclusion favourable to the proposal. Yet such a conclusion is by no means certain; as Mr. WILFRED TROTTER said in our columns last week, we cannot separate off the reasoning process as such and set it to work in an emotional vacuum; and opponents of the proposal

frankly appeal to emotion in calling for retribution to satisfy the feeling that those who commit especially horrible crimes should suffer in their own bodies To this emotional appeal there is no easy answer; if we frankly *decide* to let our feelings overwhelm rational judgment how can our claim be resisted?

It is curious that sexual crimes are so often specified as calling for bodily punishment, for a very serious objection to the purposeful infliction of physical pain, by law or otherwise, is the close connexion of such an act with perverse sexual manifestations, a connexion which is rarely enunciated in plain language It is not a matter of unconscious sadism (the existence of which need not come into consideration at the moment) but of conscious sadism which accounts for cases of apparently senseless cruelty and reaches its acme in the lust murders with which our newspapers make us familiar Short of such horrors there exists, among the sex perversions that our civilisation seems to produce, a capacity for receiving a sexual stimulus from the contemplation, in reality or fantasy, of the infliction of pain This capacity is known in early life, often before the nature of the stimulus is recognised by the unfortunate child, and many an adult, who would greet with alarm and admonitions a manifestation of normal sex development in a child, acquiesces in a punitive performance that may actually stimulate a tendency to abnormal sex development When matured, this sadism may in either sex express itself in masturbatory fantasies, or the sexual orgasm may be dependent upon the *actual* or symbolic performance of sadistic acts Medical psychologists find that patients under treatment for various troubles will describe how, perhaps against their will and in spite of their abhorrence, accounts of the wilful infliction of pain will sexually stimulate them, those who, acting voluntarily or under inner compulsion, seek a sexual orgasm by the infliction of severe bodily pain or actual injury on another, are likely to fall, and often do fall, into the hands of the law One hears of the provision of whips in brothels, and the existence of a literature of flagellation appealing to perverts is well known, some of it being disguised and some openly sexual

The incidence of the conditions here briefly described cannot be closely estimated, but those who know enough to recognise them know also that, in varying degrees of intensity, they exist unrecognised all around us Allowing validity to the emotional appeal, we must admit it is horrible to think that any one affected by such tendencies should come in contact with legalised floggings, but there are no means of preventing it The stimulation of the normal sex instinct is ever an object of control and censorship, much worse is the stimulation of one of the most distressing perversions of that instinct, which is inevitable as long as flogging is a part of our legal equipment We must bear in mind those who may be harmfully affected by the discussion or the description of deliberate infliction of physical pain

ANNOTATIONS

WANTED—BLOOD-DONORS

An extensive appeal for volunteer blood donors is to be launched by the Ministry of Health, in coöperation with the Medical Research Council, next week The appeal is for the depots which will serve civilian casualties in London and the Home Counties in time of war, plans for the rest of the country are being made locally A blood supply officer has been appointed to each of the sectors into which this area has been divided, and his duty will be to see that every hospital in his sector, especially those in the central area, could be provided with adequate amounts of blood for transfusion For this purpose a number of stations for enfranchising donors have been set up and will be open daily from 10 to 12 A.M and from 5 to 8 P.M from July 3, on six days a week Volunteers on registration will be grouped, and those who are universal donors will receive a card telling them where to report if an emergency arises Volunteers of other groups will receive cards thanking them for their offer of help and letting them know their blood-groups, in case they should themselves need transfusion Blood will be withdrawn from universal donors immediately war is declared, and stored at temperatures of 2°–4° C until required It is reckoned that 100,000 volunteers will be needed in the London area

Experience in Spain showed that the collection and storage of large quantities of blood for transfusion was carried out most successfully in specially equipped clinics with adequate plant for refrigeration and sterilisation Four such depots, at Maidstone, Luton, Slough and Worcester Park, are now being equipped for the storage of about 1000 bottles each, with the necessary apparatus for collecting and administering blood Blood will be distributed from these centres by refrigerated vans The sites have been chosen because they contain a relatively large population at a reasonable distance from London and are served by a good road system Each depot is expecting to collect a panel of 20,000 volunteer donors, of whom about 8000 will be universal donors About 10,000 donors have already been tested Any healthy person between 18 and 65 is considered suitable to volunteer and for obvious reasons it is hoped to enrol as many women as possible The addresses of centres where preparations have already been made for enrolling volunteers will be announced in the next few days

THE CARDIAZOL FIT

Since desperate diseases call for desperate remedies, psychiatrists were not disposed to reject the new treatment of schizophrenia by insulin and by Cardiazol because these methods, when first seen in action, did not particularly commend themselves as safe and agreeable There were however differences in these respects between the two methods Cardiazol had a certain advantage *Tuto* might be dubious, and *jucunde* definitely not the case, but so much weight could be put on *cito*, as it seemed, that the drug came to be widely employed, even in the wards of general hospitals, and on a variety of psychiatric disorders Dislocations of the jaw, an occasional

fractured femur—these were not taken too tragically, since the great benefits hoped for would outweigh them. Whether this is so cannot yet be decided, but graver complications are now reported On p 17 of this issue Dr. Tooth and Dr. Blackburn publish evidence that the cerebral changes occurring during a cardiazol fit may give rise to impairment of intellectual capacity and memory. This would be a high price to pay especially if the patient depended on his intellect and memory for his livelihood. It is excessively high when one considers that the "spontaneous" remission-rate in schizophrenia is, in any case, not much below that claimed for cardiazol treatment Gelperin,[1] in a recent communication, reports 94 schizophrenic patients who were discharged improved out of a total of 235 admitted to a psychiatric ward, though they had had no other treatment than superficial psychotherapy This would dispose of the argument sometimes put forward that a little hebetude is better than a chronic insanity. Both the chronic insanity and the hebetude can be averted in the case of many schizophrenics if the psychiatrist can afford to be patient and satisfied with the general psychiatric methods that were available before cardiazol and insulin had been introduced Tooth and Blackburn are cautious in their inferences and would not damn the cardiazol method outright because of its occasional untoward results: but the difficulty is to know which cases are the right ones to select for it. The deterioration they report, remarkably confirmed by psychological testing, is not the only complication of cardiazol treatment. The high incidence of vertebral fracture in cardiazol-treated patients has recently been noted in America.

PRIVATE WARDS FOR CHILDREN

It is said that when a certain royal personage was ill his surgeon assured him that he would be looked after as well as if he was a hospital patient, and he was comforted. Some such thoughts must have been in the minds of the management committee and medical staff of the Hospital for Sick Children, Great Ormond Street, in their rebuilding, for in providing private wards on the seventh floor they seem to have set out to give the child whose parents can afford to pay for it as happy and as profitable (in the health sense) a time in hospital as his poorer brothers and sisters in the floors below. There are single-cot rooms, which can be curtained off for privacy or opened into one another to provide for a nanny or other social amenities, for twenty children, and two small wards of four cots each provide that type of companionship in disease which is so often of great disciplinary value in treating minor behaviour problems Each room opens on a large balcony, well protected by railings and wire netting, with an unrestricted south aspect to let in sun and air. While forming an integral part of the whole hospital and thus sharing in all the modern services available—with oxygen on tap, mobile electric lamps and other accessories—the private floor has its own entrance, waiting-room, consulting-rooms and operating-theatre Rooms are set aside for nursing mothers, and "at the absolute discretion of the medical staff" single rooms, if available, may be used for mothers and nannies. It is probable that in this phrase quoted from the regulations lies the greatest advantage of the hospital over the home in the treatment of the sick child. Handed over to the care of skilled nurses accustomed to humouring and amusing the sick child on a basis far removed from that of the home nursery, the small patient makes quick adjustments which are only slowly reached, if ever, in the atmosphere of a home upset by the advent of illness. For surgical procedures such a programme has obvious advantages, and for the many medical disorders in which a psychological process is playing a dominant or even subservient part the complete change in environment, human as well as physical, produces results which have long been recognised among the ordinary hospital patients Great Ormond Street is not the first children's hospital to open accommodation for private patients, but thanks to the generosity of Lord Nuffield it has been possible to incorporate in the rebuilding scheme a unit which should serve as a model of its kind.

1 Gelperin, J., *J Amer med Ass* June 10, 1939, p 2393

A COLLEGE FELLOWSHIP IN CLINICAL SCIENCE

With the inauguration of a department of medicine the opportunities at Cambridge for clinical and correlative research work are now greatly improved But whereas numerous college fellowships in the past have been available for graduate students of physiology and pathology there has hitherto been no recognition of clinical science as an appropriate subject for a fellowship, partly because facilities were lacking and partly because clinical science was not yet accepted as worthy of inclusion among the other natural sciences. This acceptance is now becoming general, and the announcement that a Stringer fellowship at King's College may on this occasion be awarded to a candidate whose study or research falls within the group of subjects including clinical medicine marks a further stage in the development of scientific medicine at Cambridge For a man of suitable qualities the prospects and amenities of the appointment should offer strong inducements. Candidates must be members of the university, under thirty years of age on Dec 6, 1939 Any candidate who is in doubt if his study or research falls within the prescribed group should consult the Provost, to whom applications should be sent by Oct 16

ASEPTIC NECROSIS OF BONE

When the pressure in a diving-bell is reduced too suddenly gas is liberated from the tissues more quickly than it can be removed by the blood, and the symptoms of caisson sickness may result. In discussing the aseptic necrosis of bone that sometimes follows, and quoting four cases with autopsy or biopsy findings, Kahlstrom, Burton and Phemister[1] point out that when the body is exposed to high atmospheric pressure the gases of the air are absorbed in different degree according to the nature of the tissues Thus fat or lipoid tissue such as the nervous system absorbs about five times the amount of nitrogen that water or serum will take up, and it is such tissues that are likely to be most damaged by the liberation of gases during decompression. Oxygen is relatively easily dissolved and got rid of, but the bubbles of nitrogen set free in the fatty marrow of long bones give rise to emboli which may obstruct end-arteries and produce necrosis. If this necrosis affects the bone bordering a joint the weight-bearing portions of the bones may collapse and there may be lesions of joints, sometimes with the formation of intra-articular foreign bodies This process lends support to the view that arthritis deformans, in which the lesions are much the same, may be due to

1 Kahlstrom, S C, Burton, C C, and Phemister, D B, *Surg Gynec Obstet* Feb 1, 1939, p 129

vascular blockage and necrosis of the bone underlying articular cartilage

In a second paper [2] these American authors describe massive multiple infarcts of bones arising without exposure to compressed air The pathological and radiological appearances in some cases closely resembled those following caisson sickness The etiology of these infarcts is obscure, but the authors suggest that they may be related to the idiopathic lesions sometimes seen in late childhood It also seems possible that there is a relation between these presumably embolic conditions and "Paget's quiet necrosis," which is discussed by Hundenach in this issue Quiet necrosis may it seems, be due to trauma with a superimposed low grade staphylococcal infection, but its results are not unlike those due to infarction

ARTHRITIS IN ANIMALS

THE professor of comparative pathology at the University of Pennsylvania has lately described [3] the lesions found in 777 specimens out of 1749 dried skeletons in a number of museums, as well as similar lesions in wet cleaned bones examined during three years in the pathological service of the Zoological Gardens in Philadelphia Even in wild animals he finds signs of arthritis corresponding to those seen in man These, however, are confined to the larger animals, including apes, hyenas, bears, oxen, stags, and the cat tribe, and none have been observed in the dog tribe or in rodents or bats Domestic animals are not included in this study, but it is known that draught horses, for example often show arthritic changes in the joints

Some skeletons of gorillas present lesions which correspond, in Prof Fox's opinion, with "all varieties of arthritis" found in man In the wild boar the larger bones show ridging, as if muscular insertions had pulled upon the periosteum and produced overgrowth This is interpreted as a 'senile periosteal overgrowth, possibly a tension or traumatic reaction" Four bears in the zoo were "not suspected of having such severe articular disease," and the same may be said of the joints impaired simply by overwork in some elderly men and women An old grizzly had general hypertrophic arthritis, the anterior extremities being especially affected, with more advanced changes in the right metacarpals than in the left Among the hyenas 9 out of 16 specimens had widespread lesions—"a very striking picture" In these animals there is great development of the anterior musculature and the lesions in the hind limbs were negligible It should be noted that arthritis is not found in young menagerie animals with which may be contrasted the high incidence of rheumatoid disease in early adult age in man

Prof. Fox cites many facts which suggest a correlation between function and lesion, such as the hand and foot lesions common in primates and the liability to arthritis in the muscle joint combinations that bear the greatest strains joits or shocks His radiograms and descriptions of animal lesions are typical of osteo arthritis, a wear-and tear disease of adult or later age, in which strain and traumatism and degenerative processes—often premature—play the chief part It is widespread in the world and was perhaps as prevalent in early times as it is today That it occurs in the larger animals, subject to the same causal influences, is a significant fact On the other hand there is, we believe, little or no evidence that animals are affected by rheumatoid arthritis, now usually regarded as an infective and atrophic disease in which neither degenerative changes nor the influence of trauma can be traced

BLOOD-LETTING FROM THE FEMORAL ARTERY

IN obese patients with falling blood pressure and collapsed veins, blood letting may sometimes be desirable but difficult Greatly daring, as some may think, Emile Weil [1] has devised an alternative method which he has found both simple and satisfactory In cases where venesection is troublesome or impossible, he inserts a trocar, directing the point upwards, into the femoral artery, which even in the most collapsed patients is always easily identifiable by its pulsation By this means it is possible, he claims, to withdraw any desired quantity of blood quickly and without risk of clotting or subsequent hæmorrhage For the sake of convenience and tidiness he recommends that the blood be caught in a flat graduated basin When enough blood has been let, the trocar is withdrawn and pressure is applied to the puncture for half a minute This, aided by the elastic recoil of the arterial wall, seals the wound completely Emile Weil cannot see why the method should fail even in the most inexpert hands It will perhaps commend itself to the courageous, though they may like at first to include a tourniquet in their arteriosection kit

LIVERPOOL HOSPITAL SCHEME

As a preliminary step in launching a public appeal for funds to build a new voluntary hospital in Liverpool, Mr A V J Hinds, in a booklet entitled "Hospital Testament" (University Press of Liverpool, Hodder and Stoughton Ltd, 6d) asks why so necessary a thing as hospital treatment should depend on charity. Why not a state hospital service? Granted the necessity of state hospitals, how can the continuance of voluntary hospitals be justified—much less a progressive or intensified activity? In Liverpool, he says, the voluntary hospitals are saving the municipal authorities an annual expenditure of over £150,000 In Great Britain there are 1000 voluntary hospitals with a combined income of over £17,000,000, over 40 per cent of which comes from voluntary sources and relieves the community of an annual expenditure of over £7,000,000 The care of the sick is only one part of what a hospital service does for the community The hospital is really the source of all private medical service—general practitioner, consultant and specialist Research in clinical medicine is non productive without the hospital because in a hospital alone can be collected a sufficiency of cases The service provided by the hospital is thus threefold curative, educational, and scientific The lay committee of a voluntary hospital, it is argued, is independent, not swayed by political or bureaucratic motives, and is a guarantee that the best available persons will be selected for staff appointments, the selection actually being made for merit alone by professional colleagues and not decided solely by a political body or a lay administrator This means that the "best brains" serve not only as healers of the sick in hospital but also as university teachers and leaders of research In

2 Kahlstrom Burton and Phemister, *Ibid* March, 1939, p 531

3 Chronic Arthritis in Wild Mammals. By Herbert Fox professor of comparative pathology University of Pennsylvania Philadelphia The American Philosophical Society 1939 Pp 76 9s

1 Emile Weil P., *Bull Soc méd Hôp Paris* May 29, 1939 p 802

other words, the voluntary hospitals guarantee an alert and enterprising medical profession

In Liverpool the nine voluntary hospitals associated with the medical school of the university have about 1400 beds, whereas the municipal hospitals have about 3000. It is recognised that the municipal hospitals have come to stay, and the policy of the voluntary hospitals in Liverpool does not envisage any increase in the number of existing beds in the voluntary hospitals in that area The voluntary hospitals serve a large area extending to north Wales and south-west Lancashire, whereas the municipal hospitals can deal only with patients from within the city boundaries For over three years there has been in existence in Liverpool an Associated Voluntary Hospitals Board, which has attempted to unify the policy of the voluntary hospitals, and it works with the Municipal Hospitals Committee on the Liverpool Hospitals Joint Advisory Committee. The four general hospitals (the Royal, the Northern, the Southern, and the Stanley) were amalgamated in 1938 to form the Royal Liverpool United Hospital. They will have to be almost entirely rebuilt within the next twenty years; so it has been decided to substitute for them, close to the university, one general hospital with 850 beds, the total now spread among the four; to coördinate so far as possible the activities of the special hospitals in the system; and, when the time comes for rebuilding each special hospital, to try to relate it to the new hospital in some sort of hospital centre The four existing sites would be adapted as outpatient and casualty departments to serve the different areas.

RADIOSENSITIVITY OF MELANOMA

RADIOSENSITIVITY is a term that is often misunderstood To say that a malignant tumour is radiosensitive implies only that it shrinks under the influence of radium or X rays; this is a purely macroscopic phenomenon, and is by no means always accompanied by the disappearance of all viable malignant cells This use of the word gives rise to the paradox that many of the most radiosensitive tumours recur at the primary site and kill the patient, for radiosensitivity and a high degree of malignancy often coexist On the other hand, radioresistant tumours, though they are often among the least malignant, also kill their host because they do not respond to treatment It is therefore clear that sensitivity and resistance need not be related to the final result and prognosis There is a widespread belief that because melanomata are rarely if ever cured by radium or X rays they are therefore quite insensitive, but Ellis[1] has now shown that this is often not so, for he describes 12 cases in which the tumour regressed after irradiation This is not to say (and Ellis does not say it) that this form of treatment is as promising in melanomata as in other tumours Ellis records a series of 38 cases seen at the Sheffield radium centre in the years 1931–37 Excluding untreated cases and those in which an eye with a primary growth was removed, there remain 27 cases in which it is possible to attempt to assess the value of radium or X rays Of these, 8 have lived for periods ranging from one to six years without recurrence It is of course possible that in some of the others life was prolonged and recurrence delayed by the treatment; improvement as distinct from cure is difficult to estimate The fact remains that less than 1 patient in 3 can have been cured. Thus, though it must now be accepted that some melanomata are certainly radiosensitive, it has yet to be proved that in these tumours irradiation is the treatment of choice

1 Ellis, F., *Brit J Radiol* June, 1939, p 327

FREDERICK HOBDAY

ON the evening of Oct. 24, 1923, Clifford Allbutt presided at a memorable occasion, of which the object was to celebrate the unity of medicine as a biological study It was the first meeting at the Royal Society of Medicine of the section of comparative medicine As physic was divorced from surgery and mind from body, so, said Allbutt, had medieval perversity separated diseases of animals from those of mankind

[Harrods

We recall this occasion because it was the aim of Hobday's later life to bring the animal medicine in which he had been bred and born into fruitful relation with human medicine. He was the first veterinary president of the new section And it was not merely the utilitarian side of the relation which interested him He was particularly conversant with the diseases common to man and animals; his own work lay largely in that direction, and he had been highly successful in applying Listerian methods to veterinary surgery. But he was convinced of the place of veterinary science in the larger medicine, if only because the material of study, ranging over *many general and even orders of the animal kingdom*, was more broadly based than that of medicine, which observes a single species It was this conviction which led him to devote the fund raised on his retirement to the inauguration of a chair of comparative medicine and of a doctorate open equally to graduates of the human and the veterinary branches of medicine. He had been invited by the Chadwick trustees to deliver a lecture on this theme which was to have been the crowning achievement of his life. All those who knew him as friend of man and animals might unite to ensure that his purpose is still achieved.

On his own ground too Sir Frederick Hobday deserved his popularity and success Having qualified in 1892 at the Royal Veterinary College he began at once to teach there and soon made up his mind that veterinary medicine was not going to flourish in effete surroundings What was good enough for St Bel in 1790 was not good enough in 1900 for the chief centre in this country of veterinary teaching. Hobday soon showed that he could get things done, and, equally to the point, that he could persuade people to provide the necessary funds for doing them He raised nearly £300,000 for the new buildings in Camden Town and remained principal until they were opened by Royalty. During the whole time he was principal of the college he was also president of the organisation devoted to animal welfare now known as U F A W, which appealed to him as the embodiment of practical humaneness He was indignant of cruelties to animals under whatever guise and helped to espouse measures to eliminate

needless suffering From his earliest days he worked on the problem of anæsthetising animals and birds and it was his apparatus which first made it possible to administer chloroform safely to dogs The elaborate chapter on the administration of anæsthetics in the recent fourth edition of his "Surgical Diseases of the Dog and Cat" is largely a record of his own effort It has been said with some justice that Hobday thought not so much with his head as with his heart, but animal life may feel content with that kind of thinking

A SIMPLE WAY OF KEEPING MILK

FRESH milk is a temperamental and unstable fluid, inclined to rapid and devastating loss of flavour, and many ways have been tried to prolong its life beyond the few hours which any but the cleanest milk will keep under average temperature conditions Pasteurisation, sterilisation, 'buddensation' and the Hoflus process are all used or have been used, but most of these methods require complicated and expensive apparatus Now Davis[1] of the National Institute for Research in Dairying has described a surprisingly simple method that may prove of great value in conserving milk for days without the use of elaborate machinery It consists in adjusting the pH of the fresh milk to 6·2 with dilute hydrochloric acid and maintaining it at between 36° and 38° F In this way the milk may be kept for a fortnight or more—that is, three or four times as long as commercial cooled pasteurised milk will keep—and may then be brought back to its original pH before use by the addition of an equivalent amount of dilute caustic soda The result is a milk that is said to retain its original flavour unchanged So far the method seems to have been tried on only a small scale, but if it proves equally effective on a large scale it will have several obvious applications in the milk industry It will remove one of the minor annoyances of ocean voyages of up to a fortnight's duration, it will simplify the adjustment of supply to demand over the week-end, and it will help the manufacturer of milk products to deal with a rush period when for a few days the inflow of milk may exceed the capacity of his machinery In time of war, when delays in transport may be both unpredictable and unavoidable, it might be a convenient way of treating bulk milk carried in tanks by road or rail. Further information is needed as to the viability of the commoner pathogenic organisms in milk acidified in this way, and as to the possibilities of combining the method with pasteurisation Various difficulties besides the mechanical one of adding acid and alkali to milk on a large scale may have to be overcome before commercial success is attained, and unfortunately legal considerations may also weigh heavily against the process, for it involves diluting the milk to the extent of some 8 per cent

LOCAL EFFECTS OF ADRENALINE

THE inhalation of a vaporised solution of adrenaline as a treatment of bronchial asthma was introduced some four years ago and is now used extensively The strength of the solution has been progressively increased from the original 1 per cent, and a 10 per cent solution is now often prescribed Galgiani and his colleagues[2] have lately investigated the local effects of these solutions on the pharyngeal and bronchial mucous membranes By trieing the course of gentian violet vaporised in the mouth of a patient with a bronchial fistula they showed that most of the inhaled vapour is deposited on the pharynx, larynx and trachea, a finding that agrees with the conclusions of Spoto[3] and Rubow[4] that in dogs and rabbits not more than 3 per cent of the inhaled vapour reaches the lung They next showed that clinically the adrenaline deposited on the mucous membrane of the upper respiratory tract usually has no systemic effect, and they confirmed this fact in cats, but they found that the bronchial mucosa of cats absorbs adrenaline well, pulse and blood pressure changes being demonstrable after the deposition in a bronchus of 0·0002 mg To reach an equivalent concentration in the human bronchus by inhalation would, however, require something like a hundred inhalations They concluded that the anti asthmatic effect of the drug is due to its direct action on congested bronchial mucosa and spastic musculature, and not to its absorption into the general circulation

The next part of their work dealt with the effects of long continued use They were able to show that repeated inhalations produce pharyngitis and tracheitis in animals, and that swallowing the solution causes gastro intestinal changes A man who died of pulmonary tuberculosis after having frequent inhalations of 1 per cent adrenaline during the 48 hours before death also showed post mortem signs of pharyngeal and tracheal irritation Some time ago Fox[5] demonstrated the destructive effect on the respiratory mucous membrane of the prolonged application of adrenaline and ephedrine, and most laryngologists are familiar with the patient complaining of "nasal catarrh" who has used one of the proprietary preparations containing adrenaline, ephedrine or Benzedrine for a long time, and with the cure that results when it is discontinued The conclusion is unavoidable that adrenaline and similar compounds are unsuitable as local applications to the upper respiratory tract except for brief periods, and that their repeated use in chronic disease is therapeutically unsound

EXCRETION OF CALCIUM AND MAGNESIUM

THE impression is still widely held that the excretion of calcium and the heavy metals takes place largely through the gastro intestinal tract There is already doubt, however, as to the excretory function of the bowel in the case of iron, in fact the body seems to have little ability to excrete iron at all when once it has been absorbed, and lately doubt has also been thrown on the part played by the bowel in the excretion of calcium and magnesium The calcium of the fæces can theoretically be regarded as made up of three fractions (*a*) the unabsorbed calcium of the food, (*b*) the calcium secreted into the bowel in the digestive juices and not subsequently reabsorbed, and (*c*) the calcium excreted specifically direct into the bowel. McCance and Widdowson[6] have studied the excretion of calcium and magnesium in the form of gluconates after intravenous injection in normal people, and have found no evidence of specific excretion of the injected metal into the bowel the injected calcium or magnesium was indeed excreted rapidly and nearly quantitatively, but the additional excretion took place almost entirely by way of the kidneys and there was no increase in the calcium or magnesium

1 Davis J. G., *Nature, Lond.* June 17, 1939, p 1025
2 Galgiani J. V., Proescher F., Bock W., and Talmer, M. L., *J. Amer. med. Ass.* May 13 1939, p 1929
3 Spoto P., *Arch. int. Pharmacodyn.* 1930 39 263
4 Rubow S., *Hospitalstidende* 1933, 68, 16
5 Fox S., *Arch. Otolaryngol.* 1931 13, 3
6 McCance R. A. and Widdowson, E. M., *Lancet*, April 1939, p 753

content of the fæces The ratio of fæcal calcium or magnesium to the intake in the food was unchanged by intravenous injection of large quantities of the metal It seems, therefore, that the intestine has little or no regulatory action in connexion with the excretion of calcium or magnesium, which is in agreement with the earlier results of Nicolaysen,[7] and that the calcium or magnesium of the fæces consists merely of that unabsorbed from the food together with that secreted in the digestive juices and not reabsorbed. This conception is easier to reconcile with clinical findings than the older view of a specific excretory function of the bowel, for the majority of diseases which lead to decalcification, such as hyperparathyroidism and hyperthyroidism, do so chiefly by increasing the urinary excretion of calcium, the fæcal calcium being usually little different from normal Experimental procedures, such as the administration of parathormone or acidifying salts, also increase the urinary calcium without having any significant effect on the fæcal excretion. The only conditions in which the fæcal calcium is appreciably raised are those such as steatorrhœa, where the effect is much more likely to be due to interference with absorption than to normal absorption and excessive intestinal re-excretion.

Surgeon Captain J A. MAXWELL, O.B E , F R C S E, who accompanied the King and Queen on their voyage to America and back, has been created a commander of the Royal Victorian Order.

The British Hospitals Association has appointed a war emergency committee to consider what part the voluntary hospitals should play in the scheme of hospital services in the event of war. The proposal arises from the belief that adaptation and organisation are essential if the voluntary hospitals are efficiently to perform the service which would be expected of them in a national emergency. The committee consists for the most part of lay officers of hospitals in London and thirteen other large towns, but in three cases a medical man has been nominated by the hospital: Mr. Harold Collinson (Leeds), Prof. T. B. Johnston (Guy's), and Mr. C Max Page (St Thomas's). Mr. O. N. Chadwyck-Healey is chairman of the committee and its secretary is Mr. A. G. L. Ives (address 12, Grosvenor Crescent, S.W.1.).

FIRST-AID AT ST. MARYLEBONE

THE borough of St. Marylebone staged a demonstration of the work of stretcher parties and a mobile first-aid post on June 21. Some houses undergoing demolition were used, and the onlookers and the mobile first-aid post were placed in an adjacent plot of waste ground It was assumed that the houses had been damaged by a high-explosive bomb, the warning had been given, and the rescue-parties had released the people under the wreckage. The exercise began with the arrival of the stretcher-party combine, consisting of the stretcher party in its car, an ambulance, and a car to carry sitting casualties. Along with the combine came the mobile first-aid post in a lorry. Immediately on arrival the stretcher-party combine started work, and it became apparent why the various units must be considered as a combine and not as having little connexion with each other. In this case the work of the stretcher party and the ambulance crew dovetailed without a hitch, but it was easy to see the kind of confusion that would arise if cooperation was not carefully prepared

While the stretcher-party men were administering simple first-aid and bringing out the casualties, the mobile first-aid post was being unloaded from its lorry and set up for work in the open Standard equipment was carried, and a staff of one doctor, six nurses, and two male attendants Ministry of Health regulations do not allow any male attendants for a mobile first-aid post, but the exercise demonstrated clearly that they are needed. Casualties were then helped or carried from the houses and disposed of: the gravely injured by ambulance to the nearest hospital, and those whose injuries were such they they could wait for full surgical attention to the first-aid post The trivially injured also were taken to the post, and it was explained that some of these could be discharged without further attention at the hospital.

It was seen that the mobile first-aid post acted as a screen for the hospital and prevented it from being crowded with the full number of casualties, although the importance of this could not fully be demonstrated on such a small scale, with only about a dozen casualties In reality, as is taught at the Home Office A.R P. staff school, it is unlikely that raids would consist of widely scattered bombs; bombs would fall in groups or "patterns," the full load of a squadron of aeroplanes (about 9 tons) being dropped in one small area

This concentration of the attack would have many important effects. The number of casualties in the damaged area would be large, figures for the late war and for the Spanish war point to something like 75–100 casualties per ton of high explosive It was noticeable that the mobile post was only able to deal with two or three stretcher cases and five or six walking cases in about three-quarters of an hour, despite the fact that the work was mere demonstration and not actual surgery In war very large numbers would have to be dealt with, and moreover, if Spanish figures are to be trusted, only 15 per cent of these would be walking cases Before he could start work, therefore, the doctor would have to spend a good deal of time inspecting the casualties and deciding which should be attended to first. If the mobile post were working in close contact with the stretcher party in the damaged area, there is little doubt that he would also be called on to decide which casualties should go direct to the hospital and which should be attended to at the post This would mean that there would be a considerable delay before he could start any actual surgery. It therefore seems that there should be another doctor on the spot to classify casualties, or all casualties should be taken as quickly as possible to a post arranged to deal with the full number[1]

Here the post was set up in the open and not in some convenient building This presumably was done for demonstration purposes, so that the work could more easily be seen Yet in actual war conditions the strictly limited protection of an ordinary building would be little comfort to casualties who had so recently experienced the effect of high-explosive bombs on similar structures It is to be hoped that the recommendation of the Hailey report that such work should be done in full shelter is soon to be carried into effect.

7 Nicolaysen, R , *Skand Arch Physiol* 1934, 69 (suppl) 1.

1 See Cromo, L , Fisher, R E W , and Shirlaw, G B , *Lancet*, March 18, 1939, p 655

SPECIAL ARTICLES

IMPERIAL CANCER RESEARCH FUND

OPENING OF NEW LABORATORIES

On June 27 Sir Humphry Rolleston deputised for Viscount Halifax, the president of the Imperial Cancer Research Fund, in formally opening the Fund's new laboratories at Burton Hole Lane, Mill Hill. The laboratories were moved to Mill Hill from Queen Square a year ago and have been in use since last July. The choice of site was determined by the decision of the Medical Research Council to build their Central Institute at Mill Hill, for it was felt that the small and highly specialised staff of the fund would benefit by direct contact with colleagues with interests in other fields. The new buildings provide facilities that are far in advance of any that the fund's staff have enjoyed hitherto.

SIR GOWLAND HOPKINS'S ADDRESS

At the opening ceremony Sir Gowland Hopkins spoke on the importance of laboratory effort in cancer research. "I have spent much of my life in laboratories," he said, "and it has been one of my main interests to try to follow the effect of that great increase in the number of laboratory workers which has occurred in my time, not only in this country's contribution to scientific knowledge as a whole, but to medical progress in particular." He recalled the time when accommodation and opportunities for experimental research were sadly to seek in this country. It was then the almost universal custom among young men who hoped to devote some of their energy to scientific research to spend an apprentice year or two abroad, usually in a German laboratory, where inspiration and adequate equipment might in those days be most easily found. For this expatriation, he said, there is happily no need today, but the provision of still more laboratory accommodation would benefit both science and the country. Increases in the accommodation provided for skilled laboratory effort have never failed to be justified by results. In growing science the Law of Diminishing Returns finds no application. Our knowledge of nature has grown great, but the extent of our ignorance is much greater.

THE EXPERIMENTAL METHOD

In emphasising the extreme importance of laboratory activities in the world-wide endeavour to solve the problems of cancer, Sir Gowland Hopkins hoped that he would not be thought to be undervaluing the knowledge won by other means or the skill with which existing knowledge is applied by those whose immediate task is to relieve suffering. Of the more recondite aspects of the cancer problem the lay public usually know but little, and there are many who fail to recognise the importance of their study. Yet it is most unlikely that a complete mastery of cancer will arrive until we reach to fuller knowledge of its intimate nature as a phenomenon of uncontrolled growth. But knowledge of this kind must be sought deeper down in the nature of things than can be reached by observation alone, or by any superficial method of study. While the cure of cancer must become ultimately a medical problem, to discover its fundamental nature is a biological problem of great complexity. We are at least not likely to reach any solution of this without sustained efforts based on experimental methods. These in particular are the task of the laboratory.

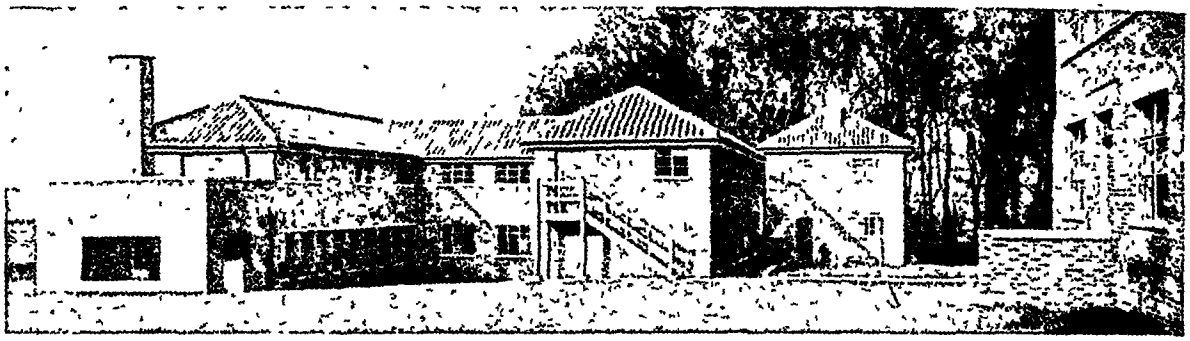
Of the many possible illustrations of the special advantages of the method of experiment Sir Gowland Hopkins chose the establishment of the distinction between typhus and typhoid fever. William Jenner compared side by side every characteristic of the two diseases which could be observed and recorded and this in a great number of cases. In sum, the evidence as one reads it today seems not far from being conclusive. But each individual item contained in the evidence lacked constancy, each contributory argument could be criticised, and was criticised, by many. Complete conviction did not come. Meanwhile, Pasteur the experimentalist was at work. Only a few years had to elapse before his brilliant and carefully controlled experiments had established, once for all, the microbic origin of infective diseases. It was still some years before the exact nature of the specific agents responsible for typhoid and typhus fever could be described, but this was merely a question of developing technique. Such evidence was bound to come after Pasteur had once started the right lines for thought and method. Real progress, and even important generalisations may doubtless result from the recording of systematic observations on aspects of phenomena directly revealed to the senses and in the established conditions of ordinary experience. In cancer research morphological studies have yielded indispensable information but they could throw little light on the underlying phenomenon of morbid growth. It is characteristic of the experimental approach to phenomena that it often yields knowledge of a kind quite unforeseen. The unknown aspects of nature that it reveals are of course part of reality, and only remain unknown because in our customary contacts with nature the conditions which reveal them to our senses are not established. The experimentalist chooses his own conditions.

Many people are inclined to say "we know that the experimental method has created subjects like modern chemistry and physics, but do not the problems of cancer belong to a category quite different from that which included subjects such as these?" We are sure today however that, like so many other biological problems, those of cancer are closely interwoven with those of the fundamental sciences.

Some years ago it used to be said that we shall never fully understand the manifestations of cancer until we have solved the riddle of life itself, with the implication that this will always remain unsolved. Such a view needs much qualification. At one level at least of their organisation living tissues are essentially physical and chemical systems, and it is at this level we must expect to find a basis for the differences displayed by cancer cells and normal cells. If the material basis of life has exoteric qualities which are neither physical nor chemical, these will not intrude into this particular arena.

EARLY WORK ON CANCER

The Imperial Cancer Research Fund was founded, Sir Gowland Hopkins went on, at a time when extreme confusion and pessimism prevailed in the medical profession on the subject of cancer. It was held for instance, by most to be a constitutional disease due to obscure qualities in the make-up of individuals which involved a liability to the disease from which

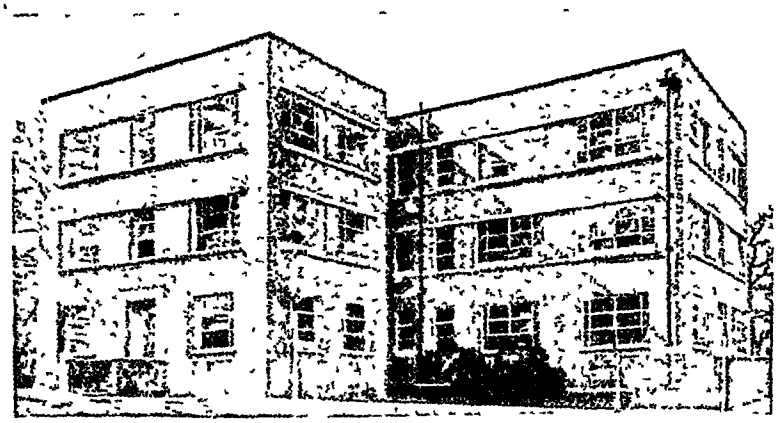


The animal house. The building accommodates rabbits, guineapigs, chickens, fish and dogs, and contains two small laboratories. Larger animals such as sheep, pigs and goats live in houses in the meadow to the north-west of this building.

there could be no escape Yet not a few believed it to be an infective and even a contagious disease inherent in civilisation itself The highly civilised communities, owing to luxury and artificial habits in matters of food, drink and the like, were supposed to have acquired a liability not suffered by primitive races or by wild animals which live more in accord with the demands of nature. These and other dogmas current a generation ago, while inconsistent among themselves, were all of a kind to make the situation seem hopeless in respect both of the prevention and cure of the malady. The belief moreover that animals do not suffer from it was for would-be students of cancer most discouraging, because in the case of maladies suffered by both man and animals so much had been learnt for the benefit of the former by studies carried out on the latter.

The earlier years of this century saw the beginning of devoted efforts which have now replaced inhibitory dogmas by illuminating facts, and the outlook has changed and greatly brightened The belief that cancer arises only in civilised communities was fated to disappear entirely as soon as more extended inquiries had proved its frequent occurrence in primitive races That animals are liable to cancer had, as a matter of fact, been demonstrated before the end of the last century, and further confirmed early in this. The highly significant fact had also been established that if a few cells from a tumour arising spontaneously in an animal were transferred to the body of another of the same species they will there continue to grow and divide, thus producing a tumour in their new host in all respects similar to that from which they were derived. The significance of these facts was at first not generally grasped and the evidence was received with apathy and disbelief Yet the modern and really progressive phase of cancer research began with a recognition of their significance, and the earliest work supported by the Imperial Fund greatly helped to initiate this progressive phase. The foundation of the fund in 1902 was indeed most timely; and, fortunately, its original staff was fully alert to the extreme importance of tumours shown to be transmissible, as illustrating one aspect at least of the essential nature of cancer. Its first director of research, Dr E F Bashford, recognised clearly that so long as the study of its incidence was restricted to its incidence in civilised man progress must at best be very slow, and, in fundamentals, perhaps impossible Investigations therefore had to be placed on a broad basis of comparative, statistical, and experimental studies

Dr Bashford contributed much to the proper interpretation of the available statistical data, and the fund has maintained its interest in this side of research; it possesses today a very expert statistical subcommittee The main activities of the fund's laboratories in the first years were devoted to a thorough and enlightened study of transmissible cancers. With increasing experience spontaneous tumours of various types were found to be by no means uncommon in animals, and they occurred in a variety of vertebrate species. When a few cells from any one of these growths were transferred to another animal of the same species their growth continued, forming in the new host, as the much more limited earlier experiments had suggested, a tumour identical with that from which the cells originated. It was also established that the implanted cells did not induce malignant growth in the normal cells surrounding them The tumour was formed from their own progeny alone. These facts illustrate a fundamental aspect of the nature of cancer, and their establishment at once gave a more hopeful outlook



The main laboratories In ground plan the institute is shaped like the letter T. The wing to the left is used exclusively for animals under experiment. The library, office, workshops, staff tea-room and store-rooms are on the ground floor, while the laboratories, operating-theatre, &c, are on the first and second floors

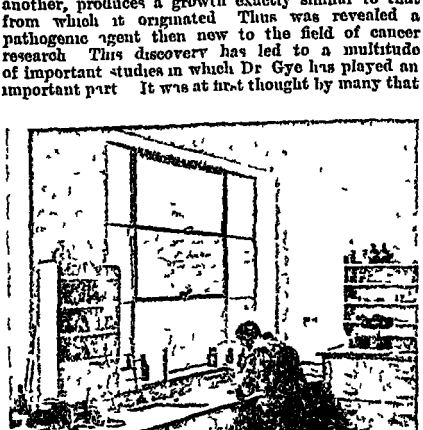
for the surgeon's art Cancer was shown to have local origins, and not to be a constitutional disease That is why the removal of a growth at a sufficiently early age may completely eradicate the disease

The conviction grew that malignant cells possess everywhere the same fundamental properties, and this is the foundation on which the experimental investigations of cancer, as it exists today, is built Of the diseases which can be produced experimentally few, if any, simulate the human disease so closely as cancer The laboratory of the fund, directed after Dr Bashford's death by Dr J A Murray, did more than any other centre at that time to establish these important aspects of knowledge The fund's staff were pioneers in this country in the systematic study of cancer by experimental means Since they began their labours centres for cancer research have greatly increased in numbers, and are to be found in nearly every civilised country It was twenty years after the foundation of the fund that the British Empire Cancer Campaign began to administer the large endowment for research which its appeals to a generous public have provided There is abundant room today for the widespread activities of the Campaign and for the independent efforts of the Imperial Fund

The library

TREND OF RESEARCH TODAY

In 1911 Dr Peyton Rous of the Rockefeller Institute in New York described a form of cancer in the domestic fowl which could be propagated not only by grafts of its cells but by cell free filtrates made from them A small quantity of such a filtrate from a tumour present in one bird when injected into another, produces a growth exactly similar to that from which it originated Thus was revealed a pathogenic agent then new to the field of cancer research This discovery has led to a multitude of important studies in which Dr Gye has played an important part It was at first thought by many that the growths yielding these active filtrates were not true cancers, but the supposed distinction has since lost its significance Cumulative evidence has brought conviction that the pathogenic agent in such filtrates is a virus It belongs therefore to a class of agents now well known as being the effective cause of various diseases in man, animals and plants Characteristic of viruses is their ability to multiply in the body of the infected host, but unlike bacteria they do so only as tenants of living cells



A corner of one of the research laboratories Large windows like this one are provided throughout The benches are supported by the cantilever system.

In a great number of cases at least, he said, we have to recognise in the file of cancer causation the initial influence of an external agent which, acting from the environment, may cause normal tissue cells to become cancerous Such may perhaps be called provocative factors in the field of causation When one of them has acted for a sufficient time, which fortunately is usually a very long time, tissue cells previously exercising only their proper physiological functions may be led to grow pathologically The influence of many of these external factors has long been recognised Long contact with certain chemical substances is one of them, as in the so called occupational cancers Workmen liable to continued contact with shale oil products, with tar or soot, and more rarely with arsenic, aniline and some other substances are prone to develop cancer Long continued mechanical irritation may induce it and also long exposure to certain forms of radiation, as was shown by the sufferings of those who worked with X rays and radium before their power to produce cancer was known

Such causative influences are exerted most readily on the skin and superficial parts of the body, and their effects are there easy to observe It is quite possible however that provocative factors, doubtless differing in kind from these, are concerned in initiating growths elsewhere in the body Such effects are apt to be spoken of as being due to prolonged "irritation," but irritation is a word with vague meanings, and we have to learn why only in certain circumstances does irritation become a stimulant to growth To attain a more definite understanding of the phenomena involved we must study the nature of internal events in tissue cells which pass from quiescence to active growth It is necessary, for instance, to discover whether the growth provoked by an external agent is always associated with chemical or physical changes in the internal economy of the cells and, if so, to learn what is their precise nature If constitutional changes must exist before growth can begin, we should look on their establishment as involving

links in a chain of events of which morbid growth is the final outcome. But certain alternatives arise here for consideration. Do external factors supply only an initial impulse to growth, which once started continues without their continued influence? This must be true of such environmental factors as chemical or mechanical irritation and radiation. On the other hand, in the case of a concrete agent such as a virus its continued presence may be necessary as a stimulus for the continuance of growth. At the same time when growth begins apparently as the direct result of "irritation" of any kind, it may be that the real effect of this is merely to reduce the cells' resistance to the entry of such an agent as a virus. Again, it is possible though not probable that the modifications which lead to growth may in some cases occur spontaneously, as a mutation in the metabolism of normal cells.

Considerations of this kind are guiding current researches, and knowledge today is fast increasing, not in extent alone but also in precision and significance. As an instance in justification of this claim Sir Gowland Hopkins mentioned the brilliant experimental work during the last few years based on the long-known fact that tar can induce cancerous growths. The combined efforts of the pathologist and organic chemist have shown that it is certain specific substances in tar which are alone responsible for the effects. The exact constitution of these substances is known, while others related to them have been artificially synthesised, and their graded capacity for inducing cancer carefully determined. These cancer-producing substances, though differing from them in details, are akin chemically to substances natural to the body—for instance, to the hormones which control certain of the functions of sex. Indeed it has been shown that in experimental animals subjection to prolonged administration of a sex hormone encourages the growth of glandular cancer, especially cancer of the breast. On the other hand work done in the laboratory of the fund has shown that by the simultaneous administration of yet another hormone this result can be prevented. Such objective facts as these should encourage equally objective and sane thought about a malady which has been so often viewed in the past from a standpoint which was almost that of superstition.

Workers in a centre of experimental activity devoted wholly to one limited end may be in danger, owing to their special preoccupations, of ignoring too much the advances won in other branches of scientific endeavour. These may often contain suggestions and even inspiration which can contribute greatly to the progress of their special task. Frontal attacks alone are proverbially not always the most successful method of dealing with an entrenched enemy. In cancer research this is especially true. Here workers should have liberty and leisure to pursue paths which, though apparently remote from what seems to be the direct one, may prove to be short cuts towards that goal.

In conclusion Sir Gowland Hopkins briefly appraised the present position of the cancer problem and maintained that it shows reasons for much satisfaction.

"With the assurance that fundamental knowledge concerning the actual nature of cancer is continuously increasing, together with the realisation that success in treatment grows with the clinician's increasing skill and equipment, there is surely justification today for an optimistic outlook. It is most desirable, he said, that the lay public should be persuaded to share in such optimism.

JUVENILE AND ADULT CRIME

JOINT CONFERENCE ON DELINQUENCY

THE Magistrates' Association initiated an important step in the scientific study of delinquency by calling a conference, with the cooperation of the British Medical Association, at B M A House on June 23. The object of the conference was to discuss how medical and psychological knowledge could be made available to magistrates in their duties, both in court and elsewhere. The morning session dealt with juvenile and the afternoon with adult crime.

THE MEDICAL OFFICER IN THE JUVENILE COURT

Lord ALNESS presided over the morning session, and after his opening remarks Miss MADELEINE SYMONS, J P, president of the Stamford House Juvenile Court, spoke. Magistrates sitting in the juvenile court, she said, cannot do their work without the help of the medical psychiatrist at the remand home, and of the child-guidance clinics, hospitals and individual doctors who examine children on bail. The practice of remanding for a purely medical examination is growing, but it is necessary to bring home to magistrates the necessity for a simple physical examination in many cases, or otherwise epilepsy, bad eyesight, pregnancy and gross mental deficiency may go undetected. The psychiatric help given to London courts is common sense applied by trained people. The root of the problem is financial: not enough money is spent on remand homes, and for the examination of children on bail the courts have been sponging on the generosity of doctors and charitable organisations. Outside London many courts have no funds to pay for the examination of children on bail. Some of the difficulties, she said, could be smoothed out by clauses 19 and 38 of the Criminal Justice Bill if it becomes law, but a serious omission from the bill is financial provision for the medical examination and treatment of children who are not offenders but who require care and protection, or are beyond control. Adequate medical facilities are also lacking; the passing of the bill into law may stimulate their provision, but a mushroom growth would be undesirable. She hoped that the new act will help in the extension of boarding-out. The vital decision whether the courts want a full physical examination or a report from a psychiatrist in a particular case rests in the hands of lay magistrates. They can only make this decision wisely if with medical help they train themselves to choose the cases which need treatment, and if they can rely on reports from properly trained probation officers who have plenty of time. Miss Symons urged that they should use fully their existing powers of remand.

INDICATIONS FOR SPECIAL MEDICAL EXAMINATION

Dr WILLIAM MOODIE admitted that his remarks would probably be distressing, disturbing and somewhat destructive. A doctor present in court, he said, can give very little help in selecting cases. He cannot pry into a child's soul on the spot and can only detect gross abnormality. He cannot advise the court unless he has a considerable amount of information about the child. Reference for medical examination has in view the best disposal of the child; treatment is far more environmental than personal. The psychiatrist must estimate the intelligence, allowing for "verbal fluency," and decide how far the child is responsible. Delinquents are on the whole, through their hostility

to the world, more backward than other children and do less well in school, so the degree of the child's hostility must be estimated. Without all this and other information about the child and his circumstances, no doctor is justified even in advising the court.

OBSERVATION, DIAGNOSIS AND REPORTS

Dr. J. D. W. PEARCE in dealing with reports on patients in custody, said that remand for special report is no handicap to the examination but rather facilitates it. Remand homes are planned primarily for non-delinquents, the remanded child attends ordinary school classes and takes part in physical drill, games and entertainments, he settles down as at home. In the absence of a history Dr. Pearce's custom is to state the material on which he makes his report. In his opinion for nearly all cases the examining doctor should be a man, as the delinquents are mostly boys and the girls are usually older and will confide more easily in a man. A stripped examination is essential, or important physical disabilities may be missed. The doctor must be in touch with general medicine, familiar with academic psychology and trained in psychiatry, and must be able to mix with patients on the common ground of humanity. He should follow a strict routine. His report must be short, lucid, unambiguous, simple and definite, and he must frankly disclose its deficiencies. He is at liberty to ask for a further remand if he thinks it necessary. Dr. Pearce urged that more child guidance clinics should be established throughout the community, they are the most suitable agencies to do the reporting for the courts.

TREATMENT

Dr. DENIS CARROLL pointed out that the word treatment includes any method of disposing of an offender which a psychiatrist may prescribe. The object must be borne in mind at every stage, and the causes, which are multiple, must all be taken into account. They call for several simultaneous and sometimes contradictory methods of treatment, and the psychiatrist must strike a balance. On the penal side of treatment a doctor rarely has anything to do, but may sometimes advise. Sociological treatment includes Borstal, approved schools, short periods in remand homes, camps, hostels and different kinds of work. Medical treatment must be directed towards organic disease, and the court must use its influence to see that parents facilitate the treatment. Psychological treatment includes suggestion, persuasion and re-education, and sometimes analytical methods. Probation officers who have attended courses on these methods and their aims are doing better work. Superficial causes can be dealt with by psychological and sociological measures, but the deep causes need medical advice and usually also medical attention before the actual treatment.

Prognosis, Dr. Carroll went on, depends partly on age. The younger the offender the better the outlook, but the habit of crime may be a more important factor than the age. The outlook also depends on how bad the mental state is in relation to the delinquency, on defects in the environment, and on the friendliness or hostility of the offender to the people who deal with him. The degree of co-operation he will give can be estimated by practical methods. The Criminal Justice Bill contains the valuable provision that medical treatment may be ordered at any time within three months after the making of the probation order. If this is enacted the doctor will have adequate time to come to a decision. Magistrates and probation officers should receive instruction from the medical angle, for they must form part of a team with the psychiatrist, the psychologist and the social worker. A routine remand in custody is unnecessary and expensive. Most of the children can be dealt with in an outpatient clinic—any psychiatric outpatient department of a general hospital with a children's branch or any child guidance clinic. A court or doctor in doubt where to send a child should write to any clinic in the district, the Child Guidance Council, or the Institute for the Scientific Treatment of Delinquency. Dr. Carroll hoped that the powers proposed to be given by the bill to local authorities to subscribe to voluntary bodies maintaining observation homes or hostels for delinquents will be used if they become law, and that magistrates will press the authorities to provide such inpatient accommodation. If enough cases are referred by the courts, facilities will be forthcoming. The limitation of treatment on a court order to twelve months is bad, and the treatment of some residential cases will collapse if payment is stopped at the end of that time.

DISCUSSION

Several speakers suggested that both male and female doctors should be available for examining delinquents. Mrs. E. G. F. BIRLEY (Manchester) thought that only a woman doctor should examine physically assaulted children, and Dr. HELEN BOYLE remarked that some boys respond more readily to a woman doctor. Dr. PEARCE, however, reminded the conference that few authorities would appoint two examiners, on the ground of expense, and only a small minority need a woman doctor exclusively. Mr. CLAUD MULLINS urged the need for punishment coupled with treatment, and declared that the probation system has been damaged by the exclusion of punishment. A fine may have value in a case where psychological treatment is needed. Dr. CARROLL agreed, with the proviso that treatment will be stultified if the offender is allowed to connect the punishment with it. Dr. R. F. BARBOUR stressed the need for examination in neutral surroundings after two or three days, so that the offender may have time to calm down, the examiner, he said, should see both parents.

Several speakers remarked on the legal difficulty of giving full information to the court before trial, particularly when it contains a statement of previous undetected offences. Dr. CARROLL said that some courts demand that all the information should be given in evidence in front of the offender, but much of the psychiatric information would be very undesirable for him to hear. Severe official comment has been made whenever the contents of reports have been disclosed to the offender, but the critics also apparently demand that the information should be given in the witness box. Mr. ALBERT LIECK (London) said that all relevant information is admissible in the report and that anything adverse to the parents is required by law to be communicated. Miss SYMONS pointed to the statutory rule that the child or parent must be told the substance of such information as relates to the manner in which he is to be dealt with. Magistrates, she thought, should be educated to recognise the kind of information which does harm if communicated to the offender. Mr. MULLINS suggested the possibility of that rule and others being declared ultra vires by the High Court if they were challenged, and no speaker was able to suggest a solution of the difficulty. The medical requirement that the court should have full information on all aspects of the offender's life appears to conflict with the principle

of law that nothing adverse to an accused person should be made known to the court unless he is given an opportunity to rebut it by cross-examination and by evidence on his own behalf

ADULT CRIME

In the afternoon session Mr. GEORGE A. BRYSON (Birmingham), who took the chair, agreed with Mr. Mullins's suggestion of the morning that probation without punishment is beginning to wear thin He said that the problem of deciding which adults are suitable for treatment is even more difficult than that of selecting juvenile cases

Mr. F. J. O CODDINGTON, LL.D (stipendiary magistrate, Bradford), said that the offender who comes before assizes for a serious crime is often remote from the ordinary run of humanity, and he deprecated the cheerfulness with which doctors are apt to report that such persons are not suitable for treatment The adult offender with whom the petty-sessional court has to deal day in and day out, and who makes up the large majority of all adult offenders, is hardly distinguishable from the adult who does not come to court The charges are nearly all concerned with petty theft, minor sexual offences and motoring offences. A large proportion of the accused are first offenders and ordinary, decent people; most of them could be saved from further crime. Mr Coddington said that he sends to prison people he cannot deal with otherwise, and imposes fines in cases where they may be reformatory, especially if payment by instalments is ordered. Medical treatment is chiefly required for elderly first offenders, and for people whose offence is utterly unrelated to their position in life or apparently purposeless. The great variety of ill health and maladjustment in such persons is surprising. Important factors are change of life, pregnancy, epilepsy, arteriosclerosis, general ill health, partial deafness or blindness, and the fear of a strict husband combined with money worries Many women offenders are utterly stale and a holiday works something like a miracle. Sexual maladjustment and loneliness are common factors.

Treatment by medical means, membership of clubs, a talk by the magistrate to the husband, arrangement for the gradual payment of debts, instruction in the elements of sexual hygiene, and similar common-sense measures are, in Mr. Coddington's experience, often successful Petty sexual offenders he nearly always refers to the doctor, and is always able to bind over They are often lonely old men who sometimes suffer from hydrocele or prostatic enlargement, and are reformed by the provision of companionship, the friendship of the probation officer or medical treatment. Young men are often restored to normality by the simplest psychological means · reassurance and an indication of a healthier outlook and way of life Some doctors are incapable of appreciating the requirements of the magistrates, but most of them can be taught. The courts want a medical examination followed by a common-sense discussion from the psychological—not the psycho-analytical—point of view Treatment, he maintained, should be planned from the medical and not the theological aspect Delinquents respond to the fact that they are being treated medically and not punitively.

Prof F. W. EURICH, to whom Mr Coddington paid a warm tribute as his medical ally for many years in dealing with delinquents, said that an offender's obstructiveness soon disappears when he finds that the doctor has nothing to do with the criminal proceedings and that the magistrate only desires to help him. The doctor must study man as a whole and not confine himself to the psychological, or even to the medical, angle. Several obscure ailments may cause delinquency—e g, hypoglycæmia, a thyroid growth, or constipation of organic origin. Apparent drunkenness in charge of a car may well be due to mild carbon-monoxide poisoning.

THE MEDICAL PSYCHOLOGIST AND THE COURT

Dr. J. R. REES put forward a classification of mental abnormalities connected with delinquency He said that investigation by the Tavistock Clinic has shown that over half its adult cases are free from crime after three years Reaction character traits are the hardest conditions to alleviate, and the psycho-neurotic delinquencies, inconsistent with the offender's ordinary culture and training, have the most hopeful prognosis He suggested that a good beginning would be to encourage every court to send for psychological help all people who commit sexual offences or irrational acts, or who repeat offences. Fewer facilities are available for treating adult than child delinquents, but local-authority clinics will improve rapidly Intuitive diagnosis is untrustworthy unless founded on a long practical experience of psychopathology Expansion must be slow, and for some time the courts will have to be content with sound diagnosis and advice on treatment A full treatment service is costly and cannot be organised quickly The court should institute follow-up investigation for research into the value of treatment

In discussing the afternoon's papers, Mr. MULLINS pointed to the grave difficulty that, outside London and the big cities, most delinquents are sentenced within a few minutes of the ascertainment of their guilt, and a remand for inquiry is unusual Assizes and quarter sessions can only adjourn the case to their next sitting, which may be months in the future Public opinion and the authorities must have impressed on them the need of time for proper inquiry between verdict and sentence Only medical men can bring this need home Dr REES, on being asked what provision is being made for the training of medical officers for outpatient clinics in the country, said that the Institute for the Scientific Treatment of Delinquency holds week-end courses and lectures, the Tavistock Clinic gives two-year and shorter courses for psychotherapists; and the Maudsley Hospital provides lectures for the diagnosis but not the treatment of delinquency. If the new act results in enough remunerative work being available for these officers, he said that a supply will soon be forthcoming—especially if, at the same time, steps are taken to encourage young medical practitioners to take up psychotherapy in the provinces At present no great inducement is offered to the newly qualified person to train in psychotherapy.

The conference resolved to recommend to the Magistrates' Association and the B.M.A. that a small joint standing committee should be established to further the coöperation of magistrates and doctors in the treatment of delinquency.

ELECTRONIC REACTIONS AND DIPHTHERIA.—The adjourned inquest at Leigh, Lancashire, on the boy who died from diphtheria after having been attended by Mr C C. Abbott, an unqualified practitioner who made his diagnoses on electronic reactions, was concluded on June 21 (see *Lancet*, June 24, p. 1457). After an absence of an hour the jury returned a verdict of death by misadventure.

THE LISTER INSTITUTE

CLINICIANS reading the whole of this year's annual report from the Lister Institute of Preventive Medicine will find themselves travelling far from the bedside Sometimes it is the distant journey—the apparently remote investigation—that discovers the biggest treasure, whether for the cure or the prevention of disease In a brief review of the year's work, however, we can mention only those of the institute's inquiries that have an immediate bearing on medicine or health, and, indeed, only a few of these

VIRUSES

Acute rheumatism and rheumatoid arthritis—Dr G H Eagles has continued his studies on the etiology of rheumatic infections Attempts to demonstrate the infective power of the virus like particles procurable by high speed centrifugation of exudates and tissues from rheumatic patients have failed In *collaboration* with Dr W H Bradley, however, he has demonstrated that the sera of patients with rheumatic fever, rheumatoid arthritis and certain other arthropathies agglutinate such particles, whereas sera from persons in normal health do not No consistent relation of agglutination to clinical phases was found, nor any evidence that it runs parallel to antistreptolysin titre or erythrocyte sedimentation rate

Acute rheumatism and the pleuropneumonia group of organisms—Homer Swift and Brown, of the Rockefeller Institute, have recently announced the isolation of a pleuropneumonia like organism from rheumatic fever exudates (see *Lancet*, April 22, 1939, p 938), and this may prove to be the long sought *etiological* agent of acute rheumatism In any case the finding opens up a new field and already Dr Eagles and Dr Helga Jahn are collaborating with Miss E Kleneberger, Ph D, in the cultural study of rheumatic material Should *organisms of this group* be recovered steps will be taken to determine whether the "virus bodies" studied at the institute by Dr C R Amies and Dr Eagles, which are agglutinated in the presence of sera from rheumatic fever and rheumatoid arthritis, are really the filtrable elements of a pleuropneumonia like organism, or possibly breakdown products antigenically related to such organism

Avian sarcoma—Dr Amies and Mr J G Carr, working on the filtrable agents of the Rous I and other fowl sarcomas, report that it has lately become possible to obtain adequate amounts of these agents in a relatively pure form—i e, in suspensions containing 1,000,000 tumour producing doses per c cm Serological experiments with these concentrated suspensions have yielded still more evidence that the agent is closely related antigenically to some constituent of normal fowl cells It has been established, for example, that the serum of a rabbit hyperimmunised with normal fowl protein will neutralise the tumour agent in vitro, and that these inhibiting properties can be removed by absorption with a concentrated suspension of the tumour agent In the fowl, the agent behaves as a foreign protein because its presence in the malignant tissue and elsewhere elicits the formation of neutralising antibodies and agglutinins It is believed that a full understanding of this phenomenon would constitute a big advance

Smallpox vaccination with elementary body suspensions—In cooperation with Dr R G Henderson and other officers of the London County Council, Dr D McClean (Elstree) has continued the experimental immunisation of nurses and children by intradermal injection of elementary body suspensions of vaccinia virus The resulting immunity, as tested by revaccination with Government lymph after not less than six weeks, has proved disappointing, and there is some indication that the development of a firm immunity depends on the development of a typical vaccinal vesicle at the primary vaccination When applied by scarification, the suspension of elementary bodies produces typical vaccinal vesicles with general constitutional reactions indistinguishable from those produced by vaccine lymph

SEROLOGICAL STUDIES

Antityphoid serum—Mr A Felix, D Sc, with the assistance of Miss R M Pitt has continued his investigations on methods of titrating therapeutic antityphoid serum The Vi titres of the sera, as determined by the agglutination reaction, run parallel with their protective values as determined by tests in mice which received a test dose of living virulent typhoid bacilli The O titres of the sera, as estimated by the agglutination reaction, run parallel with their protective values as determined by neutralisation tests in mice which received a lethal dose of killed typhoid bacilli ("endotoxin") Provided it is known that the Vi antibody in the sera does not exhibit the peculiar "functional deficiency" described by Felix and Bhatnagar in 1935, the Vi agglutinin titre as well as the O agglutinin titre can be accepted as the final measure of the therapeutic activities of the two antibodies The routine titration of samples of serum taken in the course of preparation of therapeutic antityphoid sera consists, therefore, in agglutination tests alone

Dr D W Henderson (Elstree) finds that the Vi or the O antibody will protect mice against infection with a fully virulent Vi+O strain of *Bact typhosum*, but when a large number of fatal doses are given the Vi antibody is relatively more efficient than the O antibody

Prophylactic inoculation during a typhoid epidemic—The desirability of carrying out vaccination in a population exposed to typhoid infection has been questioned on the ground that undesirable reactions may intervene, followed perhaps by frank disease in persons harbouring the causative organisms Such persons may be incubating the disease—in which case vaccination may, it is said, accelerate the onset of symptoms—or they may be temporary carriers until vaccination converts their state into one of frank infection Correspondence on this subject appeared in the medical press, two years ago, in the light of advice tendered to authorities concerned with the control of a typhoid outbreak (*Lancet*, 1937, 2, 1319, 1402, 1454) In an attempt to find an answer Dr H L Schütze has taken the mouse as the experimental animal and *Salmonella typhi murium* as the infecting organism The results of a large series of experiments demonstrate, he holds, not only that vaccination started after infection does not damage the animal's normal resistance, but that in a considerable proportion of cases it actually enhances it

Plague—Dr Schütze, investigating the effect on plague infection of M & B 693, Solseptasine, and a diamino diphenylsulphone glucoside, observed a considerable curative effect on the part of all three compounds M & B 693 proved most efficacious against plague in both rats and mice, solseptasine protected rats and not mice, and the sulphone compound protected mice but not rats (*Lancet*, Feb 4, 1939, p 266)

SERUM-PROTEINS IN HEALTH AND DISEASE

Mr. R. A. Kekwick has continued his work on the behaviour in the ultracentrifuge and electrophoresis apparatus of normal and pathological serum. The electrophoretic constitution of normal human serum has been established and shown to differ fundamentally from the picture obtained with sera from cases of multiple myeloma, kala-azar, and acute rheumatism. The abnormalities found in the protein constitution of these pathological sera were well marked and consistent for a given disease. It is not possible to say how specific they are until a wider pathological field has been investigated.

ENDOCRINOLOGY

Dr. V. Korenchevsky, with the assistance of Miss K. Hall, Mr. R. C. Burbank and Miss M. A. Ross, has further examined the activity of sex hormones in the rat.

Effect on senility.—Testosterone propionate, he finds, can produce in senile rats even supernormal development of the sex organs, but it does not cause any noticeable improvement in their appearance and behaviour. As these organs and sexual function may be well preserved in otherwise senile animals and men, the absence of a "rejuvenating" effect of the sex hormones is held to be not surprising. The over-stimulation of the secondary sex organs of senile rats by testosterone propionate cannot be regarded as a rejuvenating effect, since, without simultaneous improvement of the general condition, this sex stimulation is biologically unnatural "and in human patients is medically undesirable." Moreover, the administration of testosterone propionate depressed the development of the sex glands of the senile rats, thus checking the secretion of the natural sex hormones by the testes. The development of the sex organs may be stimulated or depressed by some of the male hormones according to the dose injected.

Tumours were found in the hypophyses of two of the injected senile rats.

Sex hormones with prolonged activity.—Recently enol and aliphatic esters of sex hormones have been prepared, chiefly by Swiss scientists. The most important feature of these esters is their prolonged activity after the cessation of the injections. With certain of the doses used the maximum effect of testosterone dipropionate and œstradiol dipropionate was maintained for at least 10 days, and that of œstradiol benzoate-butyrate for more than 106 days, after discontinuation of the injections.

"*Precancerous œstrogenic changes*"—Injections of œstradiol dipropionate are followed, it is stated, by development in the uterus of metaplastic changes in the epithelium, which are the first stage of a precancerous condition. This develops more frequently, or in more severe form, when androsterone, *trans*-dehydroandrosterone and testosterone dipropionate are injected with the œstrogens. On the other hand, progesterone and (when injected in a special ratio to œstradiol) testosterone propionate can prevent the precancerous changes.

ACCESSORY FOOD FACTORS

Progress is recorded in the work of standardising vitamins A, B_1, and E, in the investigation of the B_2 factors, and in the study of pellagra and related disorders of animals.

Vitamin-C requirements of man.—Mr. S. S. Zilva, D.Sc., and Dr. A. E. Kellie have finished an investigation in which the minimum daily dose required to maintain an adult "saturated" in respect to vitamin C was ascertained. Equilibrium of excretion was established on doses of 100 mg., 50 mg. and 30 mg., and the minimum "saturation" dose was found to be in the neighbourhood of the last figure. Previous investigations on animals suggested however that a daily dose of about half the "saturation" dose is sufficient to meet the theoretical requirements of man. The ascorbic-acid content of the blood was determined during "saturation" and "unsaturation" at different intervals after the administration of the vitamin in various doses. The comparison of these figures with those of the urinary excretion suggests that there is no constant renal threshold for ascorbic acid, but that there is a competition for the ascorbic acid of the blood by the absorptive capacity of the tissues and the excreting function of the kidney. Blood levels determined at random do not, therefore, indicate the degree of "saturation."

Vitamin C in vegetables and fruits.—Dr. Zilva, collaborating in an investigation of the ascorbic-acid content of King Edward VII potatoes lifted from the soil at various stages of development, and of the decline in vitamin-C concentration during storage, reports that the content reached a maximum at the third lifting, in early September. On storage at 10° C. the potatoes lifted in October lost the vitamin rapidly at first but later more gradually. The fall in samples lifted before October—i.e., the normal time of lifting—was strikingly greater.

To ascertain the effect of storage on vitamin C in canned apples, samples canned early in 1935 and tested in 1936 were re-examined in 1938. A 50 per cent. loss was recorded, previous intermediate tests had shown this to be progressive.

TYPE CULTURES

The National Collection of Type Cultures (Medical Research Council) has continued to expand. Some 6300 cultures of micro-organisms have been distributed during the year to workers at home and abroad and many new strains have been deposited for maintenance. A new and revised report on the genus salmonella will be presented to the nomenclature committee of the International Association of Microbiologists at the International Congress for Microbiology to be held in New York this autumn. The report is being prepared by the salmonella subcommittee, of which Dr. R. St. John-Brooks, curator of the collection, is secretary.

THE LANCET 100 YEARS AGO

June 29, 1839, p. 514.

From a leading article

A KNOWLEDGE of nature is obtained in two ways,—by observation, and by experiment. *Physicum id est speculatorem, venatoremque naturæ*, says CICERO. We observe, record, and determine the relations of natural phenomena, or we produce effects in order to determine their relations and causes. The experimental sciences, and the sciences of observation are, however, identical, for it is indifferent whether physical phenomena occur spontaneously, or are artificially produced, so far as regards the determination of their laws. But experimental investigation is often more attractive than observation. The observer is a sentinel, a looker-on, or, at the most, a watchman upon the lofty towers of nature, the experimenter, on the contrary, is animated by the pursuit of his game, his blood is heated, his hopes are on the stretch, the forms of truth fly and double, appear and disappear, before the hunter's aching eyes, and the pleasure of the chase is as thrilling as that of the capture. How many have lived and died happy in the search after ideal objects—for instance, the philosopher's stone and the elixir of life!

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations Each contributor is responsible for the section for a month, his name can be seen later in the half-yearly index

FROM A WOMAN PUBLIC HEALTH OFFICER

I

THERE is a mocking Gaelic proverb which has ornamented my desk for some years It runs "He is a good hurler,* is the man on the fence" I love it partly for the salutary warning it holds for the bureaucrat and partly for the picture it evokes One can feel the wet Irish wind on one's face, and hear the clashing of the hurley sticks, while the excited lad on the fence nearly topples off as he shrieks valueless advice at the straining players One suspects, too, that the reason the man is on the fence and not in the team is just because he isn't good enough Some day if he isn't careful fate may play him a nasty trick and bring him down from his perch, thrust a hurley stick into his hand, and bid him get on with the game himself Even so do I find myself a dispenser and no longer a critic of Grains and Scruples

* * *

It is a queer business this of turning over the garnered store of nearly forty years to find some thing worthy of being shared with colleagues known and unknown A man's most treasured possessions too often seem like junk to the stranger's eye, and his deepest convictions mere infantile prejudices At this singularly gloomy phase of the world's history when the sky is black with "intimations of mortality" the only sensible advice is that of the evangelical hymn "Count your blessings one by one" Looking back, perhaps the first of these for the young medical student was the contact made at the very outset of one's career with great teachers and great traditions Perhaps doctors do not always realise that in this respect they are privileged beyond the entrants to other professions That our best men spend so much time in teaching kindergarten has some regrettable results but no other system could spread so widely the riches of their minds and personalities

The arrangement of the curriculum (which I do not intend to discuss) has no doubt improved immensely in recent years but I doubt if the present day hierarchy of the profession provides as generous a feast for the observant young as did the professors at my own Scottish university We still retained the Victorian tradition of highly developed individuality The pride and joy of the school was a famous authority on forensic medicine equally beloved for the rareness of his lectures and for his discrimination as an examiner He had an infallible method, worthy of wider imitation, for reassuring a nervous student On the examination table stood the usual row of evil smelling little bottles containing material to be "spotted" As the tongue tied one hesitated the kindly old gentleman, hero of a hundred *causes célèbres*, absentmindedly rotated the bottle so that the label came to the front It was said that after a myopic youth had nearly defeated him he always kept a bottle of copper sulphate crystals in reserve for desperate cases Only once did he fail below his own high standard Asked to explain his eccentric marking of a brilliant paper presented by a woman student, daughter of a colleague, he is said to have retorted fiercely, "Well he ploughed my son and by gad, I'll plough his daughter"—but quickly repented Thanks to that generous heart, no police man's form ever darkened the wards of our great infirmary, Sir Henry thought the suggestion of punishment an outrage on the sick and bullied the authorities into compliance, cheerily regardless of not infrequent escapes

The women students at least were ready enough to welcome the police as escorts of outpatients In the cramped little casualty room which was all the territory allotted to us, they subdued our patients' lurid language, taught us how to handle a razor, and told us thrilling stories of the underworld while we stitched cut heads In those days of cheap whisky one expected most casualties to be drunk, and I can recall a New Year's Day when of 82 accident cases only the first 20 were even approximately sober The police, who knew the sordid background of their lives, gave us our first lessons in tolerance

* * *

To return to the more orthodox instructors, many of the great folk round us remained merely names, for the women were kept under as near an approach to the purdah system as a mixed school permits We were forbidden university lectures, and for clinical teaching were restricted to the wards of the junior surgeon and physician on the staff who had each to put in a purgatorial five years teaching the interloping sex But we could afford to chuckle at the way things turned out A system that gave us Professor Caird in surgery and Sir Robert Philip in medicine left no resentment Caird was a man whose personality should surely be recorded, to inspire other generations as he inspired ours A magnificent teacher of his subject, he was also supremely successful in conveying lessons that the surgeon can impress on students' minds as no one else can Meticulous care in examining and recording the simplest case, and a beautiful courtesy and consideration for patients were part of the routine of his wards Later, experience in provincial hospitals opened one's eyes to the different standards which existed and I imagine still exist in this respect It is the sort of thing that in any hospital or institution percolates from above down

We had luck of another sort in the midwifery lecturer, Dr Ballantyne Not that he was much of a lecturer, for only too rarely did he allow his pawky sense of humour or his undoubted vision to overflow into the rather dreary discourses he delivered in the Surgeon's Hall But one day he abandoned his notes and very shyly confided in his class of some 18 young women his dreams for easing the burden of pregnancy, for making delivery safer by intelligent preparation, for giving the infant a better chance by caring for it throughout gestation It was a new gospel at the dawn of the century, the class was moved to break into unexpected cheers—and Dr Ballantyne blushed and retired into his shell Later he told some of us that he was meeting with little support from many of his obstetrical colleagues who thought that ante natal care even for private patients was dangerously fussy. The notion that it should be available for *all* women had to wait for a concomitant development of the social health services, in the same

* Hurley is the Irish version of hockey

that the aeroplane had to wait for the invention of the internal-combustion engine.

Dr. Ballantyne could get back neatly on some of his critics and I have heard him relate—in private—the following tale. An Eminent Obstetrician who had been engaged for the confinement of a Great Lady, received the call to her bedside towards the conclusion of a very festive dinner Some inward voice told him it might be wiser to send his assistant but he reflected that the latter was a pushing young fellow and anyway the smell of chloroform *à la reine* covers a multitude of other odours Everything went swimmingly It was one of those ideal cases where nature—i.e., the mother and maternity nurse—does all the work True, the baby was on the small side, but it was of the right sex and the mother seemed more than satisfied. The eminent obstetrician felt fully justified in hastening off to a bed that every moment appeared more desirable, but had only reached the foot of the front doorsteps when he heard his name called. He looked up and saw the nurse grimly regarding him from the doorway, "Well, nurse, have you forgotten anything?" he asked impatiently "No, Sir, but I thocht mebbe you had the twin"

* * *

Not even a desire to compensate for the news on the wireless could however persuade me that if the hands of the clock could be turned back all would be well Entrants to the nursing profession may be scarce now, but I should hate to see them plentiful—and bullied and overworked and underfed as they were thirty years ago Again, over-specialisation may be the curse of the profession, but from the patients' point of view its absence is still more to be deplored. In all that great Scottish infirmary there was no anæsthetist; all anæsthetics were given by students, taught only by their seniors and equipped with a folded towel, a gag and tongue forceps, two safety-pins and a bottle (unmeasured) of chloroform. If a surgeon found (as Mr. Caird once did) during the vacation that his list included an excision of thyroid, a carcinoma of the breast, and an excision of the kidney and the only student on duty was a girl of 19 in her second year, they both went ahead without comment. The results were astonishingly good, but I always felt that the guardian angels of all concerned were being tried rather high.

The chief difference on the debit side, however, was the complete lack of social services, of aftercare to consolidate the good work done in the wards, and of the *preventive* outlook generally You will still hear modern advances spoken of as though they were an unprovoked attack on an ideal system of private practice. One remembers how much of the illness one saw was due to deficient nourishment and to an inconceivable filth of hair and person. The only preventive measure that occurred to anyone was to blame the unfortunate mothers or to proffer them lordly advice on a matter on which none of us, male or female, had the slightest experience—i.e., running a working-class home on a working-man's income I count it not least of our blessings today that the working-woman is no longer a bundle of squalid rags surrounded by rachitic and verminous children.

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A batch of papers from a college for "nursery nurses" has just come in for correction Written in clear round hand this statement catches my eye "The skin contains salacious glands . . . and censory nerves." How wise are the dispensations of providence

PUBLIC HEALTH

School Medicine in Manchester

In an introduction to his valedictory report to the Manchester education committee Dr Henry Herd discusses briefly the two chief contentions with which his name is associated—the relations of the school medical officer with the public-health service and education department, and the place of routine inspections in the medical supervision of school-children. Manchester is one of the few localities where the medical officer of health is not the school medical officer, the latter being appointed by the education committee and having no official connexion with the health office But in most large local units the executive school medical officer, though nominally an assistant, is largely independent of the medical officer of health who contents himself with coördination of the school service with the rest of his department So in practice it makes little difference whether or not the school medical officer is independent of the medical officer of health, provided that there is complete cohesion between the two officers, and in recent years this has been generally achieved Unless there is close coöperation between school medicine and child welfare reduplication of effort occurs, the children lose continuity of supervision and many matters which should be remedied in infancy are deferred until school age. Moreover, the health of children attending school is much influenced by the variations of infectious diseases; the school officer must be in touch with the officer whose chief function is epidemiology On the other hand, school medicine is intimately connected with education. As Dr. Herd says, "the school medical service can never be a purely medical service, but must be very closely identified with the general educational service" The bond between school medicine and general education grows closer, as the fitting of abnormal children to their educational environment is becoming the chief work of the school medical officer.

Dr Herd has for several years urged reform of the system of routine medical inspections At the congress of the Royal Sanitary Institute, held in Bournemouth in 1935, he was one of the leaders of the reform party which sought to replace routine inspections at fixed times by more general inspections of all children at shorter intervals and continuous supervision of those who were defective, or whose health or normality was doubtful The case of the reformers is very strong, although for their system to be successful more labour and greater skill are required than can be commanded everywhere The Board of Education makes routine inspections the cardinal point of school medicine, those who think with Dr Herd look upon them merely as adjuncts to continuous supervision In districts where the school department is properly staffed all that Dr Herd advocates could be obtained without abolishing any of the routine inspections—to a large extent he has himself achieved it

The records of the school medical department of Manchester do not differ materially from those of other cities There has been the same steady improvement in the health and physique of the children, similar increased attention to matters formerly considered to be of minor importance, and an increase in the

quality and expedition of treatment for those children who need it In Manchester a definite improvement is shown in children as they grow older of the entrants 22 8 per cent required treatment, of the twelve year old group only 14 7 per cent Most of the conditions calling for treatment were either trivial blemishes, physiological deviations, or minor ailments to which little attention was paid before the development of school medicine The most important purely medical work of the school department is in connexion with abnormal conditions of the upper respiratory tract These include tonsils, adenoids, enlarged glands, nasal catarrhs, and otorrhœa There was a time when all manner of evils were attributed to adenoids and the T & A operation was regarded as the remedy It is now agreed that upper respiratory catarrh is a highly complex matter, involving many factors and calling for many forms of treatment, amongst which removal of adenoids or tonsils or both still occupies an important place Otorrhœa and nasal catarrh, though they have diminished greatly in frequency, are still amongst the chief worries of the school medical officer To Dr Herd and his generation, acting with throat specialists attached to the school department, we owe most of our present knowledge of upper respiratory catarrh at school age In this report much space is given to throat and nose defects, including an account by Mr Brian Robinson of the results of dissolvation, which should be read by all who are not familiar with this form of treatment

During Dr Herd's tenure of office great advances have been made in child guidance, and, in coöperation with the physiological department of Manchester University, work has been done in genetics and physiological variations which are gradually changing the outlook of school medicine When he started the chief work of the school doctor was to detect and obtain treatment for children suffering from diseases and defects which should have been detected and treated before, his main work has shifted to fitting to their environment individual children deviating from normal

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M P.

THIS week has been remarkable for two defeats of the Chancellor of the Exchequer The first defeat was one by negotiation, that in which the Chancellor withdrew the duty on films The explanation then was that it had not been possible, because of the need for secrecy in all Budget arrangements, to consult the trade and that an error of calculation had been made Perhaps But on this the House remained slightly sceptical Whatever the reason however the withdrawal of the duty a defeat by negotiation, happened The second defeat was a defeat by argument and organisation inside the House of Commons The Chancellor had proposed to repeal the duties on patent medicines and the excise licence but had not proposed to control the sale of patent medicines or appliances or any of the preparations which come within the description of proprietary medicines in any alternative way The duty was to be repealed and the field left open without any attempt at control This proposal attracted a great deal of attention as soon as it was known after the Chancellor had made his Budget speech The Medical Parliamentary Committee considered the matter and its members, who belong to all parties in the House, consulted with their friends as to what was likely to be the outcome of this proposal

It was agreed of course that the duties were archaic and in need of revision A select committee of Members of the House of Commons had reported in that sense as lately as 1937 But this committee, which was unanimous, proposed an alternative method of taxation and a further control not only of medicines but such apparatus as deaf-aids and such substances as quasi medicinal beverages and quasi nutritious foods To have the whole of these very carefully considered recommendations brushed on one side was more than the members of the select committee could stomach

In a very short time it became clear that a large body of opinion in the House of Commons was opposed to the repeal of the patent medicine duties unless they were replaced by some alternative method of control The existing amount of control by taxation and licence is not great but to repeal the duties would have thrown the patent medicine trade wide open The pharmaceutical chemists had also considered the question and they added their influence to the persuasions of the already informed members of the House of Commons, and, at a later stage, circularised all members and pointed out, among other things, that in case of repeal of the duties "unless some further change in the law is made any person or persons can, from September next, make and supply medicines to the public through any vendor or automatic machine, without disclosing the composition of the medicine sold This will most likely result in a great increase of so called cures of unknown content for self medication, which would constitute a grave public danger"

The pharmaceutical organisations and individual chemists were not, however, the origin of the opposition to this repeal They came indeed fairly late into the field It was organisation inside the House of Commons by the Medical Parliamentary Committee and the members of the select committee that started the ball rolling By Thursday, June 22, when the Finance Bill came up for discussion in committee of the House, opposition to the duties had so hardened that as many as 200 supporters of the Government, led by Sir Francis Fremantle, were asking for the postponement of the repeal for some years—which was of course equivalent to rejection Another amendment, put down by Mr Lewis Silkin and Dr Haden Guest of the Labour Party and Mr Gwilym Lloyd George, Mr Graham White and Sir Percy Harris for the Liberal Party, was supported by over 50 names, and there was only a small minority of members in either opposition party who were in favour of repeal. The remarkable situation was presented of a large proportion of members of all parties being against the abolition of a tax—quite contrary to usual parliamentary procedure But up to the actual time of the debate on Thursday evening—which was, unfortunately for purposes of press publicity, at a very late hour—the Chancellor had given no indication of his attitude

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The attack was launched by Mr Graham White for the Liberal Party, who recalled that on the second reading of the Finance Bill the opinion of the House appeared to be against repeal and said that the more

he considered the matter "the more inadequate" seemed the reasons advanced for the abolition of the duties Mr Graham White had hoped we were moving towards the adoption of a nation-wide medical service but the proposed repeal was an attack on the national health service; and he recalled how the Ministry of Health had deplored the use of advertisements and quack remedies in connexion with cancer. The Chancellor of the Exchequer would, however, open the way to the sale of any nostrums or quack remedies Sir Arnold Wilson, who was a member of the select committee which reported in 1937, urged retention of the duties for a further period of at least one year in order to replace them by "something better and more effective." There was no reason for precipitant action as the duties had "been going for 100-odd years and can very well go on for another year"; meanwhile the Chancellor would be "in a position to reconsider the whole thing in all its bearings, which are much wider than those merely of the revenue" Sir Arnold Wilson saw no objection to taxing proprietary medicaments and preparations, "whether medicinal or quasi-nutritive, whether aids to beauty or to health, to sleep or to relieve pain" If the duties were repealed, he said, we should be "the only country in Europe and almost the only country in the world except the United States . . . where patent medicines and proprietary medicines are not taxed" It appeared that alternative schemes had not been discussed with representative interests and some of the largest druggists in the country had said they were not consulted The National Pharmaceutical Union and the Pharmaceutical Society of Great Britain were not consulted The point in Sir Arnold Wilson's admirable speech which attracted most attention was that in which he quoted the Chancellor as saying: "Not only are the present duties unworkable—they are being worked unlawfully and our action has been challenged," and he recalled that the firm which had thrown down this challenge was F. W Woolworth & Co., whose managing director appeared before the select committee to give evidence "The managing director said he wanted to sell more drugs, and he could sell far greater quantities in 2*d*. or 3*d*. packets than in 6*d* packets and the stamp duty prevented him selling his smaller quantities." If it was necessary to meet this challenge of an action for damages Sir Arnold said "many of us" would have preferred to see the Government lose the action The situation could have been dealt with by retrospective legislation, because, although this course is disliked, in principle if anyone in the country "puts a pistol to the Chancellor's head, we would willingly come to his support" Sir Arnold considered that if the taxation of cosmetics was added to that of medicines the duty would bring in from 3 to 5 millions, an important amount of revenue, and taxation would facilitate control.

Dr. Haden Guest dealt with the matter entirely from the health point of view and described the proposed repeal as "an attack upon the health of the people" It would be a grave injury to health although of tremendous advantage to certain large interests The proposal to repeal was received "with a whoop of joy" by certain circles in the city. There had been some big financial flotations and "inflations of a really disgraceful character in the patent medicine racket" in recent years. There is a great amount of money in the trade; the select committee calculated it at £20,000,000 a year on a moderate estimate and it was a trade built up, in the words of the select committee, "by making the people, largely the poor and less well educated, spend more money than they can afford on remedies of little or no efficacy with an accompanying indirect danger to health as a result of their not seeking medical and surgical treatment in time" It was a trade based "on an appeal to fear." Dr. Guest proposed that if the Government persisted in the repeal the Government front bench should give "an unequivocal undertaking and understanding that they will bring forward legislation to control the whole of the patent-medicine and patent-instrument industry"

The debate was one very largely in the hands of the medical M.P.s, the two next speakers both being doctors. Sir Henry Morris-Jones urged the Chancellor to give way to the arguments which "represent a very strong feeling in the country" and he was mystified as to why, at this time, the Exchequer should "throw away a matter of £1,000,000 a year" in taxation.

Dr. Edith Summerskill agreed with Sir Henry across the floor of the House and said that if the Chancellor repealed the duties "he will be aiding and abetting a gigantic swindle throughout the country," and she gave examples of the constituents of certain patent or proprietary medicines. She asked the House to imagine what would happen "when the whole market is flooded with these people, who are just waiting to deceive." No one spoke for the Chancellor until Mr. A. V Alexander of the coöperative movement, and he was lukewarm as he said the cooperative societies "had always been against the wide advertisement of worthless remedies." The House however, including the Labour Party, was so impatient of Mr. Alexander's tepid support that he had to reply to an interruption by saying "I hope the Committee are prepared to listen," and there was a good deal of interruption later.

Sir John Simon to conclude the debate made a half-hour speech of exposition of the reasons which had led him to propose the repeal of the duties and referred to "the existing bungle of ancient statutes on this subject" which were "little more than a lot of incomprehensible irrelevancies." The Chancellor was subjected to a number of questions on his speech, by Sir Francis Fremantle, Sir Arnold Wilson, Mr Latham, a member of the select committee, and others. But the victory of the House, led by medical opinion, over the Chancellor was signified when he said that the sense of the committee evidently was that they would like to get some new treatment of the problem of patent and proprietary medicines combined with the repeal of the duties. "I have no doubt," he said, "that is the feeling of a very large part of the committee I do not myself feel at all confident that that can be done." The Chancellor then announced that he would be willing to maintain the duties for another year with a view to reconsideration of the whole position.

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The debate was a notable one, but a debate which finishes after half past eleven even although very lively does not get well reported in the daily press But the debate showed the influence of well-informed opinion outside the front bench circles The vote was left as a "free" vote by the Labour Party, and the Government whips were quite unable to get their supporters to vote for the Chancellor on this occasion Danger remains however, for an "industry" that at a moderate estimate is worth £20,000,000 a year is a very big vested interest. It is fortunate therefore that the medical and pharmaceutical professions have shown themselves so much alive to the public-health aspects of these duties and that members of

the House of Commons have shown themselves willing and able to take independent action The general conclusion, among members of all parties of the House after the debate, was that it was a glorious victory for democratic institutions As one member put it, "the House just would not have the repeal of these duties"

FROM THE PRESS GALLERY

The Decline in Population

In the House of Lords on June 21 Viscount SAMUEL called attention to the prospective decline in the population, which was causing widespread concern In the age of Malthus the great problem was how to check the increase of population, now the situation was entirely changed While the production of foodstuffs and other commodities had vastly increased, the means had been discovered to control the birth-rate, and the increase in population would soon be replaced by a decrease It was not enough merely to take the crude birth rates and death rates of the population and compare them, the future depended on the age-constitution of the population and on other factors The chief point, he said, for consideration was the number of live births per thousand women of possible childbearing age, taken as being from 15 to 45 In 1891 this number was 109 8 in England and Wales At the last census in 1931 it had fallen to 64 3 In the 'nineties one out of every four women between these ages would give birth to a child in any particular year, as against only one in eight in the 1930's That was a remarkable and unprecedented change not spread over centuries, but taking place in the course of a single generation There had been, of course, some counterbalancing factors The death-rate had fallen greatly, though not so greatly as the birth rate In 1891 the rate was 19 7 per thousand, now it was about 12 4 In particular the *infantile* death-rate had fallen with great rapidity During the present century the strenuous efforts by the state, local authorities, social workers and the medical profession to reduce the death rate had had a phenomenal success In 1901, when this movement really began to take effect, the number of infants under twelve months who died was 140,000, or one in seven of all the births of that year Now the number had been reduced to 35,000, or one in sixteen of the births That was to say that 100,000 babies who would have died in the previous generation were now saved Another counterbalancing factor was the fact that instead of people emigrating in thousands to the Dominions, the United States and elsewhere, there was an inward movement on balance of 20,000–30,000 people But these factors were far from counterbalancing the fall in the birth-rate

ECONOMIC AND STRATEGICAL RESULTS

Various hypothetical estimates had been made, Lord Samuel continued, of the result of these trends if continued into the future Dr Laybourne had concluded that by 1970 the population of England and Wales would be reduced from 41 million to 30 million Another estimate by Dr Charles showed that the actual decline would begin in 1941, and that at the end of this century the population would be reduced by half Of that reduced population nearly half would be over sixty These calculations might prove wrong, *but they demanded* immediate attention Some thought that this country was overpopulated, and that it would be no bad thing if we were reduced even to 20 million But the truth was not that this island was overpopulated, but that its population was badly distributed Overcrowding in England was far worse in the 19th century, with a smaller population, than it was today From the economic point of view a decline in population must mean a great diminution in productive power Again some held that because there were 1½ million unemployed the country must be overpopulated, and that if our population were reduced by that number, we should get rid of the unemployment In the 19th century, when the population of England and Wales was 10–15 million, there were periods of terrible unemployment and distress, whereas in the year before the late war, when the population was 36 million, everyone was employed It was obvious how grave would be the effect on revenue if the number of producers and taxpayers were seriously reduced, and the burden of pensions for an older population, and the heavy charge of debt which was being handed on to posterity, could hardly be borne by a greatly diminished population There was also the strategic aspect The man-power of a nation was an essential element in preserving its position in the world Unless the tide of emigration could be again enabled to flow England would not be rendering the service to the world she was able to do in previous generations

ITS ÆTIOLOGY AND TREATMENT

The causes of the decline, which was not limited to Great Britain, were due to no physiological change in the human race but to deliberate conscious human action Children were not born because prospective parents did not wish them to be born, and had found means to prevent conception without forgoing marriage or intercourse The reason for this state of affairs was largely economic—poverty, or the fear of poverty Furthermore, parents had to consider the interests of the children they already had from the point of view of nutrition, education and general prospects There was also the question of housing Among the non-economic reasons was the health of the mother, which was prominent in the minds of many prospective parents

There were some, Lord Samuel said, who suggested that the practice of contraception ought to be suppressed by law The Departmental Committee on Abortion said in its report

"We cannot accept the contention put forward in some quarters that the use of contraceptives to avoid pregnancy is fundamentally and in all circumstances wrong, and we doubt whether that view would be shared by more than a minority of persons in this country"

Even if suppression were attempted it was highly improbable that it would succeed Contraception was not the cause of the decline, it was the means by which it was effected The better course would be to remove the real cause—the desire for smaller families From the economic aspect a most effective means of doing this was the institution of family allowances as part of, or supplementary to, the wage system of the country In France such allowances had been adopted for many years, and now 7 million workers were covered by wage schemes involving allowances That meant the great *majority* of the workers of France No less than £20 million was distributed in France in 1937 in family allowances and the amount this year and last year would probably be far more There were also limited schemes in Belgium, Germany, New South Wales and New Zealand

It was necessary to make childbearing as safe, as painless and as inexpensive as possible for every mother in every class of society The question of extending national health insurance to the child dependents of contributors was also important, as was the campaign for better nutrition The removal of the marriage bar in certain occupations and extended income-tax reliefs for wives and children deserved consideration A definite population policy was needed, and attempts should be made to turn the current of public opinion in favour of marriage and parenthood and not against them The whole matter, especially the question of family allowances, should be investigated by a Royal Commission

Lord SNELL did not expect the fall in population to be calamitous He believed that the real problem of population was qualitative rather than quantitative, that it was darwinian rather than malthusian The late war robbed the country of something like a million potential fathers War itself was dysgenic in its effects, it took from the population the most

vital members and left behind those whose vitality was not so great. It was possible that this was only a temporary period, and that a new equilibrium of population would later be established.

A MEDICAL VIEW

Viscount DAWSON OF PENN agreed with Lord Snell that they must consider the quality of the people far more than their forefathers had done. The day had gone by when there were a large number of children born and Nature took off the weaklings. Today the nation was very properly trying to preserve its people, and something had to be done to take the place of Nature's methods But the graphs authoritatively issued showed that the fall in population was too great even if they did have regard to quality. This country had failed to reproduce itself since 1925. In 1880, the peak year, 100 women during their fertile period produced 150 girl babies. That was no doubt in keeping with the views on population of that particular period. No-one would wish that 100 women should produce 150 future mothers today. Now 100 women produced only 76 girl babies or future mothers. The curve had flattened out during the last two or three years, and Lord Dawson hoped that was a portent of better things. But however much they regarded quality they must have a big enough population to have an adequate turnover if they were going to bring the young people and the fit people to the top. The composition of the population was even more important than its numbers. In 1881 the proportion of people over sixty to those under twenty was as one to six. In 1931 the proportion was as one to three, and next year it would be as one to two. If the present trend went on, by 1960 there would be an equality, one and one, and that meant that there were not enough young lives coming in at the bottom to reinvigorate and replenish the nation. Already there was more accommodation in the schools than there were children to fill it A change might come, but the curves did not point that way at present.

It was sometimes said that the effect of civilised conditions was to reduce the amount of fecundity of both men and women, but there was no evidence of any mass tendency in that respect. The dominant immediate cause of the diminished size of families was contraception, which was extending in all classes and in all creeds. Contraception had come as the result of social changes; it was not due to a double dose of original sin, but to the evolution of life. It was only a specialised example of man's gradual control of natural forces One of the things that made contraception inevitable was the reduction in infant-mortality. The safety-valve of a high death-rate was taken away, too many children lived and therefore it was economically impossible to keep them. A way out had to be found somewhere. The woman of today was determined that her maternity should be a matter of choice not chance. She made her maternity a planned part, not the wasteful whole of her life through twenty years, as used to be the case. The chief reason why families were kept down was anxiety in some form or another. Before contraception was an established institution marriages in the early twenties were often impossible. Broadly speaking, he did not see any disadvantage in contraception provided parenthood was not postponed after the age of 25, but there was the risk that people would be apt to extend the childless period too far.

Lord Dawson suggested that the first remedy was further knowledge, which would allay fears about maternity, give instruction and bring home to people a sense of values A parenthood instruction service should be set up If they taught people how to rear babies in the child-welfare centres, was it not reasonable to go a step further back and teach them the wisdom of producing them?

The second remedy he suggested was social and economic Parents who were otherwise willing to bear their quota of children should not be financially penalised The state should help with some form of allowance which should relate to the children and not to the workers. It should be payable to the mother, if possible, and should relate to welfare and have little or no connexion with wages. If it was paid by tokens they should ensure that the money should go towards nutrition. The tokens should secure milk and such like things for the children. In regard to housing, they must provide for small communities in such a way that the children could have easy access to the air, and creches, nursery-schools, and other necessities should be provided If provision was made for continuous education after leaving school some of the difficulties they were discussing would be dissolved.

THE NEED FOR MORE DATA

Lord STAMP urged the necessity of a quinquennial census. He argued that if during the past century, with a much more leisurely time-limit of change than existed today, a ten-year census was right, surely something more frequent was necessary now. The fertility inquiry of the census of 1911 should, he said, be reintroduced. That should take precedence of other inquiries, for the information was urgently wanted by the bodies which were considering these problems. At the moment all their calculations had to be based on foreign comparisons. The question of the number of children born of each married woman, the number of children still living, and the duration of marriage were not merely academic questions to satisfy statisticians, mathematicians and population experts. They were the essential basic information, not merely for population problems but also for housing. A gap was left in our recent population statistics which the Government could fill. The occupation of the husband was done now by a schedule that was positively rudimentary and probably dangerous, or at any rate misleading. This ought to be made similar to the census of occupations. If they were to devise any rational policy they must know what the net reproduction-rate was for those in certain occupations or belonging to certain classes

Lord TEMPLEMORE, replying for the Government, said that this was eminently a subject where they must have reliable data, and complete data were not yet available. The most comprehensive material they possessed was at the disposal only of the Registrar-General, and his experience suggested that some of the published forecasts expected an earlier decline in population than the facts justified Some of the estimates made had already been falsified or discarded, and during the last six years the realised experience had pointed to a postponement of the date when a decline was possible. For the first time since 1873, the beginning of the decline, the birth-rate began to rise in 1934, and that tendency had continued unbroken for five years in succession. Whereas the percentage of increase of population fell till in 1933–34 it was 0 31 per cent, in 1934–35 it had risen to 0 43 per cent, in 1935–36 it was 0 45 per cent., and in 1936–37 0 44 per cent In 1937–38 there was a little decline to 0 42 per cent., but these figures emphasised the need for caution in forecasting future figures The marked check in the decline of the birth-rate during the past five years might be associated with the relative economic recovery of the country. Without suggesting that a decline in population was not a possibility after the next fifteen or twenty years, he thought that the matter was far more open than was generally believed A number of countries had adopted family-allowance systems, but in general it was not possible to detect any significant association between the allowances and the birth-rate. The only country with a record of a material increase in its birth-rate ensuing apparently from statutory political measures was Germany, where the rate rose from 14 7 per thousand in 1933 to 18 per thousand in 1934. For this change the introduction of a system of non-interest bearing marriage loans, 25 per cent. of which was cancelled on the birth of each child, was held to have been partly responsible. There was a considerable difference of opinion about the desirability

of adopting proposals of this nature The more sensational and pessimistic forecasts of population had been based on the assumption that the birth-rate would continue to decline below the 1933 minimum of 14 7 per thousand, whereas if the present level was maintained, even without further improvement, it was unlikely that the population would fall below the current total of 46 million for two or three decades They needed far more data before they could reach a basis for Government policy or action The Government had already taken steps to collect such data From the Population (Statistics) Act, 1938, which came into operation on July 1 last year, information would be obtained which would throw a valuable light on the varying incidence of fertility in different sections of the population, and a body of data would be built up from which details of the changes taking place from time to time would be immediately detected The collection of these data would, of course, take time Even if this did not directly reveal the basic causes of these changes, it would serve as an indispensable background of fact, both for the testing of variations in regard to the previous basic factors, and also for estimating and measuring the results of any concerted attempts to vary their natural course When the data became available they would be able to see whether the position was such as to demand action, and, if so, what action would be most likely to prove effective

Medicine Stamp Duties Retained

In the House of Commons on June 22 the clause in the Finance Bill repealing the medicine stamp duties was considered in Committee Mr GRAHAM WHITE said that it was not the duty of the Government to abandon revenue simply because they had reason to apprehend difficulties in administration If they threw over these duties and allowed the sale of remedies to go on without let or hindrance as to place, quantity or description that could only be an attack on the national health service of the country

Sir ARNOLD WILSON did not think there had been another occasion within living memory when more than 200 members of the House had begged the Chancellor of the Exchequer to continue a tax There was general agreement that the present duties were archaic and should go, and also that they should be replaced by something better If this clause were omitted from the bill the Government would be given the opportunity during the next twelve months to reconsider the whole subject The repeal of these duties would, unless others were substituted, facilitate the expansion of a trade which, to put it mildly, urgently needed control and restriction The chief medical officer of the Ministry of Health in his report for 1934 almost invited the taxation of medicines, even of the sort prescribed by doctors He said

> A considerable proportion of the total outlay on drugs prescribed by the medical profession, averaging 3s per head, could be limited without detriment, indeed with advantage and to the proper treatment of the people

Oliver Wendel Holmes went further when he told Harvard medical school

> If the whole materia medica could be sunk to the bottom of the sea, it would be all the better for mankind, and all the worse for the sea

Sir Arnold Wilson's nurse put it still more succinctly

> Remember, child, that doctors think
> More men have died from drugs than drink

No attempt, he said, had been made to devise an alternative scheme Was it to go on record that no scheme could be evolved by the Commissioners of Customs and Excise for a reasonable tax on medical preparations? He was assured that there had been no consultations officially or unofficially, with representative interests He agreed that pharmaceutical chemists had had a certain protection hitherto, but the 200 members of the House who were opposing repeal held that those chemists should have that protection They ought to be protected from competition by grocers, cheap-jack stores, and hawkers The repeal of the tax would discourage the publication of formulæ, a matter of real importance Most members had lost all hope that the Ministry of Health would promote a bill dealing with proprietary medicines At least ten attempts had been made by private members to get such a bill through Parliament, but they had all failed Now, in the 5s stamp booklets to be bought at post-offices, drugs were advertised which had been specifically banned by name as fraudulent by the whole press of Fleet Street The Minister of Health ought to bring in a bill to prevent his colleague from advertising medicaments which were notoriously dangerous

Dr HADEN GUEST said that the repeal of this tax amounted to an attack on the health of the people of this country It would, of course, be of tremendous advantage to certain large interests The work of the patent-medicine vendor was based on the exploitation of fear, and was buttressed by the prostitution of medical terminology in the service of boosting quack remedies If this proposal passed, the Chancellor of the Exchequer would be immortalised in the future as the "stop me and buy one" Chancellor of the patent medicine industry

Sir HENRY MORRIS-JONES said that not only the retail chemists, but all the drug trade, all the medical profession, and a large body of public opinion in the country were completely mystified as to why at a time when the state was in greater need of revenue than it had been in living memory, they should throw away a tax bringing in a million pounds a year, while at the same time jeopardising the public health of the country

Dr EDITH SUMMERSKILL said that if this clause was allowed to stand the Chancellor would be aiding and abetting a gigantic swindle throughout the country An opportunity would be given to every bogus patent medicine vendor to flood the market with any preparation he liked without obligation to put the formula on the box A few months ago there were certain preparations on the market containing iodine which were being used by young girls for slimming It was exceedingly dangerous for young girls to use iodine preparations There were two or three fatal accidents as a result of overdoses, and these preparations were withdrawn Now it was proposed to open the market again to those who put on to it these harmful drugs

Mr ALEXANDER urged that where the formula of secret remedies was not disclosed to an independent and qualified body, that particular commodity should be banned If they really wanted to control patent medicines in the interests of the health of the people, such commodities, whether dispensed by a pharmacist or not should be banned altogether

Sir JOHN SIMON, Chancellor of the Exchequer, said that it was not very likely at this time of day that he wished to lose revenue These medicine stamp duties were one of the curiosities of the statute book. They had been described by a learned judge as "a mass of confused and obsolete verbiage" They were 130 years old They were enacted at a time when ideas about medicines and cures were very different from today, and the attempt to retain them involved all sorts of ridiculous distinctions For example, the law provided that duty was to be paid if the remedy referred to an organ of the body, but there was to be no duty paid if the same remedy referred only to the organ of the body and did not mention the ailment If one offered "kidney pills" there was no duty, but if one called them "back ache kidney pills" a tax had to be paid It was true that the administration by the authorities of this tax was challenged, and it was a very serious thing for the Chancellor of the Exchequer to allow a challenge to go against a tax which his officers were collecting; all the more so when the advice he was given was that his position was exceedingly doubtful The truth was that it was impossible to apply the acts as they should be

applied. He could well understand that there were questions of public health and public control involved here; but he could not agree that medicines were a good subject out of which to raise taxation. The select committee in their report recommended that a duty should be imposed on a very wide range of medicines and remedies, practically all medicines and remedies except those made up from the prescription of a doctor. If that was the view of the committee as a whole it certainly did not agree with his view. He had done his best to see if he could find a tolerable modification, but he had failed. The select committee took the opinions of a large number of people, including witnesses speaking for the British Medical Association, who strongly took the view that the existing taxes were not justified, and asserted that if one wanted to try and discourage quack remedies the right way to do it was not by taxation But having taken evidence the select committee proposed a new scheme of duties Under their proposals there would have been no preference to chemists at all. A whole range of things would have been brought under the duty, in fact anything except a doctor's prescription. Was it really the general view of the committee that he should have adopted that alternative? This duty did not protect the public health at all. (An hon member. "Yes it does.") He was only expressing his humble views.

Dr GUEST: Against all the medical and pharmaceutical profession

Sir JOHN SIMON I do not think I can be accused of that, since I am relying on the evidence given by a spokesman of the British Medical Association, Dr. Bowman, who before the committee said he did not consider that the interests of health were to be served by putting taxes on things, but by regulations.

Dr. SUMMERSKILL. . When a doctor makes a statement of that sort it does not mean that he has circularised the profession and asked their views in any way He is not speaking for the whole profession by any means; they are his own views

In conclusion, Sir JOHN SIMON said that evidently the sense of the committee was that they would like, if it was at all possible, to get some new mode of treatment combined with the repeal of the duties He did not feel at all confident that that could be done, but he was perfectly willing to take the matter up with any other department concerned, and see whether it could. He was willing to maintain the present duties for another year. (Cheers) In the interval they must see whether it was possible to examine the position both as regarded the possibility of this or any other tax, and also as regarded the aspect of public health.

QUESTION TIME

JUNE 21–28

Medical Examinations of Militiamen

Mr LAWSON asked the Minister of Labour if he could give the latest figures with regard to the medical examination of militiamen.

Mr. ERNEST BROWN The number of men medically examined up to June 19 was 49,586 Of these 41,297 or 83 3 per cent. of the total were placed in grade I, and 4553 or 9·2 per cent in grade II, but of this number more than half were in that grade only on account of defects of vision or feet The total number of men passed fit for the two grades now being called up for training is, therefore, 45,850 or 92 5 per cent Of the remainder, 2443 men or 4 9 per cent of the total were placed in grade III which is the grade appropriate to men who would be fit for certain selected occupations in the forces but are not at present to be called up for the militia The number unfit for any form of military service and placed in grade IV was only 1293 or 2 6 per cent. of the total The following table gives corresponding figures for each of the administrative divisions of the Ministry

MILITARY TRAINING ACT, 1939 ANALYSIS OF RESULTS OF MEDICAL EXAMINATIONS DURING THE PERIOD JUNE 8 TO 19, 1939

Grade	Numbers medically examined. Division— London	S E	S W	Mids	N E	N W	N	Scot	Wales	Totals	Percentages of men medically examined Division— London	S E	S W	Mids	N E	N W	N	Scot	Wales	Overall percentage
I .	7612	3831	3351	7072	1592	5368	2810	4565	2096	41,297	82 5	84 1	81 5	83 5	85 4	80 3	86 3	84 9	83 3	83 3
II .	318	158	107	357	145	343	92	164	132	1,876	3 5	3 5	4 1	4 2	2 7	5 1	2 8	3 1	5 3	3 8
II(a) (vision) .	457	191	155	321	250	320	117	178	68	2,057	4 9	4 2	3 8	3 8	4 6	4 8	3 6	3 3	2 7	4 1
II(a) (feet) .	111	68	68	105	69	85	17	75	22	620	1 2	1 5	1 6	1 2	1 3	1 3	0 5	1 4	0 9	1 3
Total of II and II(a) .	886	417	390	783	464	748	226	417	222	4,553	9 6	9 2	9 5	9 2	8 6	11 2	6 9	7 8	8 9	9 2
Total of I and II	8498	4248	3741	7855	5056	6116	3036	4982	2318	45,850	92 1	93 3	91 0	92 7	94 0	91 5	93 2	92 7	92·2	92 5
III .	508	193	224	420	212	369	132	257	128	2,443	5 5	4 2	5 5	5 0	3 9	5 5	4 1	4 8	5 1	4 9
IV . .	230	115	145	200	109	200	88	137	69	1,293	2 4	2 5	3 5	2 3	2 1	3 0	2 7	2 5	2 7	2·6
Grand totals ..	9236	4556	4110	8475	5377	6685	3256	5376	2515	49,586	—	—	—	—	—	—	—	—	—	—

The Question of Standard

Mr LAWSON asked whether the standard for these militiamen had been lowered as compared with the regular soldier —Mr. BROWN said that the medical examinations of the regular forces had in view the need of particular units, while the examination of militiamen was of a more general character

Mr LAWSON. Is the right hon. gentleman aware that the Army report on the conditions of health and examination shows no difference of that kind, and that we have always been led to believe that there was a general standard? Is he aware that his statement has led people in all parts of the country to believe that the standard has been lowered for militiamen and that his answer has given colour to that statement?—Mr. BROWN That is not so I am informed that the standards have been changed in some respects in regard to the regular army in recent years So far from the report showing what the hon member suggests, if he will refer to the annual reports for 1936 and 1937 he will find the details of these changes.

Mr. SORENSEN Can the right hon gentleman inform the House whether the present medical examination is more or less severe than the one carried out during the last war?—Mr BROWN · It is much more detailed Hon members who served last time will know that during the war the examination was conducted by one medical man as a rule In this case there are four medical men working under a chairman

Mr SORENSEN · Is it not true that the length of the examination is only four or five minutes, and in those

circumstances could there really have been a very thorough examination of the militiamen?—Mr BROWN, I suggest that I arrange for the hon member to attend at one of the medical boards and see for himself

Mr SORENSEN May I take it that at a very early date after the examinations have been completed we shall have these detailed records in order that we may have a very good insight into the medical condition of an important section of the community, and also in order that we may avoid the impression that prevails in some quarters that under any circumstances the men have got to be inside the armed forces?—Mr BROWN That impression is entirely false I should have thought that every member of the House, and everybody outside, would be proud of the fact that our social legislation within the last thirty years has given us these great results

Particular Defects

Mr JOHN MORGAN asked the Minister of Labour if he was aware that X. Y had been passed as fit for military service even though he wore a glass left eye, and would he state the regulations covering such a decision.—Mr ERNEST BROWN replied The instructions to the medical boards provide that persons with one eye only may be placed in grade II and marked "(a) vision," provided that that eye is free from disease and reaches a specified degree of visual acuity

In reply to a further question by Mr SORENSEN, Mr ERNEST BROWN said I regret that it is not practicable at the present stage to analyse the results of the medical examinations so as to furnish statistics of particular physical defects but I will consider what can be done when the examinations are complete Militiamen with only one eye may, in certain circumstances, be placed in grade II if the other eye is sound Men with defects of hearing may be placed in grades I–IV according to their condition The men examined are not tested for colour-blindness The examination includes a scrutiny of the teeth, and militiamen reporting for training will be fitted with artificial dentures, where this is considered essential, and without charge

Militiamen and Disability Pensions

Mr STEPHEN asked the Secretary of State for War if all militiamen who broke down in health during the period of service and were no longer fit for work would be allocated pension in view of the fact that they had been certified as fit men before being called upon to undertake such service—Sir V WARRENDER, financial secretary to the War Office, replied A militiaman will be eligible for a disability award if his disability is attributable to service It will be appreciated that, although a man may be passed fit on entering the service, he may subsequently acquire a disability, or a latent disability may manifest itself, which has no connexion with his military service

Mr STEPHEN asked the Minister to see that the examination was conducted so that latent disabilities would be discovered before the men passed into the army—Sir V WARRENDER I think that is beyond the wit of the medical profession

Mr STEPHEN If it is beyond the wit of medical men, will the Minister see that information is given in every case, when the medical man certifies that the man is fit for service, if he develops disabilities afterwards?—Sir V WARRENDER We endeavour to deal with cases in as kindly a fashion as we can, trying to avoid hardship, but it would be impossible to accept liability for all accidents which might happen to a man during his service

Mr SILVERMAN asked whether if the medical examination could not possibly disclose some latent defect it was possible for medical evidence at a later date, when the defect developed, to be sure that it was not due to military service—Sir V WARRENDER said that there had to be some evidence that the man underwent some exposure or hardship during his military service to which his disability could be traced

Mr SANDYS Is it not the fact that six months' training can improve a man's health?

University Students and Military Training

Sir JOHN MELLOR asked the Minister of Labour whether, in view of his consultations with representatives of the universities and schools, he was now able to make a further statement with regard to the antedating of militia training in the case of boys who intended to proceed to the universities after October, 1939—Mr ERNEST BROWN replied Yes, Sir At a meeting held under the auspices of my department on Monday last between representatives of the committee of vice chancellors and headmasters, together with representatives of the departments concerned it was agreed to recommend that boys intending to proceed to the universities were given the double option of postponing or anticipating their liability to undergo military training I intend to put this agreed conclusion into operation, subject to reviewing the position in twelve months' time in the light of experience, when I propose again to seek the advice and assistance of the representatives of the universities and the schools It was further agreed at the conference that anticipation of the liability to undergo training in respect of such boys should not be granted to those under the age of 18 years on Jan 1 of the year in which they wish to take their training With regard to this recommendation, I cannot do more at present than say that it will be borne in mind when applications for anticipation are considered

Mr MANDER Was this agreement unanimous?—Mr BROWN Yes, Sir

R A F Medical Tests

Mr GORDON MACDONALD asked the Secretary of State for Air how many applications had been made to join the Royal Air Force during the last 12 months, the number accepted, and how many failed to satisfy the medical tests, and the principal causes of such failure—Sir KINGSLEY WOOD replied The total number of applications to join the regular Royal Air Force during the 12 months ended June 17 was 91,447 41,325 acceptances resulted from these applications, and there were 18,105 rejections on medical grounds The principal reasons for such rejections were visual defects and physique below the required standard

Mr MACDONALD Can the right hon gentleman say whether his department take any action in regard to those rejected on such grounds and try to get the disability removed?—Sir KINGSLEY WOOD I will inquire

Hospital Staffs and A.R P Badges

Mr HUBERT BEAUMONT asked the Lord Privy Seal why officers and staffs of county hospitals and institutions who had taken the essential courses of training and passed examinations in connexion with air raid precautions were not being issued with air raid precautions badges—Sir JOHN ANDERSON replied The air raid precautions badge is intended as a recognition of the obligations undertaken by persons who volunteer for local authorities' and other air raid precautions services, and persons who take special courses of training in order to enable them to carry out their normal duties under war time conditions are not merely by reason of their having undergone such training eligible for the badge I understand, however, that the Minister of Health has under consideration the question of providing some other special form of recognition for the staffs of hospitals and institutions in such circumstances as are mentioned in the question

Civil Defence and Evacuation of Young Children

Mr DAY asked the Minister of Health what information he had received as to the success or failure of the scheme for registration for the evacuation of children under five years of age, and what steps he proposed to take to ensure the safe evacuation of the younger child population from districts outside the London area—Mr ELLIOT replied I have received returns from a number of evacuation areas which show that the initial response from mothers of children under five has so far, in many cases been encouraging The registers are in general still open In London the returns have been lower than in some other towns, and I would appeal to mothers with young children

to register. The Government evacuation scheme already applies to eleven areas immediately adjacent to the administrative county and to twenty-two provincial areas. As indicated in a reply which I gave on May 18 I am reviewing the possibility of extending the scheme to certain further areas

Army Rejections on Medical Grounds

Mr. WILLIAM JOSEPH STEWART asked the Secretary of State for War the number of men who enlisted in the Regular Army during 1938 and 1939 and the number of applicants who were rejected on medical grounds—Sir V. WARRENDER replied: The numbers of recruits finally approved for the Regular Army during the calendar year 1938, and during the period Jan 1 to May 31, 1939, were 38,827 and 20,197 respectively The numbers of applicants for enlistment into the Regular Army during the periods in question who were rejected at medical examination were 7299 and 3278 respectively.

Mr. GORDON MACDONALD asked for the number of persons offering themselves for enlistment who, on being found below standard, had been sent to one of the recruits physical development depots; and also whether the results had been satisfactory.—Mr HORE-BELISHA replied: The number sent to the depots is 2775 Of these, 2044 have been posted to units as fit and only 196 failed to reach the standard after training.

Silicosis Scheme

Mr JAMES GRIFFITHS asked the Home Secretary when the order extending the period of certification under the Various Industries (Silicosis) Schemes would be issued; and if he could state the provisions contained in the order, and whether it would be made retrospective—Mr. PEAKE, under-secretary, Home Office, replied: The amending scheme was made on June 12 and I understand that copies are now available. The scheme extends the limit in the proviso to paragraph 4 of the principal scheme from three years to five My right hon. friend was advised that he had no power to make it retrospective. He has, however, suggested, through the Mining Association, that the colliery owners might undertake to deal with claims where the workman has been employed in the mines within the three years preceding the date of the amending scheme, as if the limit in their case were five years and not three I understand that this suggestion is under consideration.

Young Persons in Factories

Mr. PARKER asked the Home Secretary what representations he had received from manufacturers asking him to suspend the coming into force of section 71 of the 1937 Factory Act on July 1, 1939, and to suspend section 73; and what answer he had given—Sir SAMUEL HOARE replied: I have no power to suspend either of these sections but section 71 contains a provision that the coming into force of the section is postponed as respects any particular industry where a public inquiry has been ordered but no final decision has been reached on the question of fixing for that industry a higher figure than 44 as the maximum number of working hours in a week for young persons under 16 A considerable number of applications for more hours than 44 has been received. Many have been refused or withdrawn; in the case of some industries inquiries have been or are to be held; and in the case of some others the question of directing an inquiry is now under consideration Under section 73 there is power to extend within certain limits the overtime permissible Regulations for that purpose have been made for various classes of factory, and applications from some other industries for such regulations are still under consideration

Cheap Milk for Mothers

Mr TOM SMITH asked the Minister of Agriculture how much of the exchequer subsidy voted under the Milk (Extension and Amendment) Act, 1938, was being used to help maternity and child-welfare authorities to start cheap milk schemes, and the price charged to the local authorities for the milk; how many authorities had inaugurated such schemes and their names; how many expectant and nursing mothers were receiving milk free and for payment, and the price in the latter case; and how much milk was normally given daily in each case and for what period.—Sir R DORMAN-SMITH replied While I am hopeful that it will be possible to introduce in the near future a scheme for the supply of milk at reduced prices to English local authorities in connexion with their maternity and child-welfare arrangements, negotiations to that end have not yet been completed No sums have, therefore, as yet been paid under the Milk (Extension and Amendment) Act, 1938, in respect of milk supplied under such a scheme in England A scheme has, however, been introduced for the area of the Scottish Milk Marketing Board

Contagious Abortion in Cattle

Mr W. ROBERTS asked the Minister of Agriculture whether he proposed that free testing of cattle for contagious abortion should be now included in the provisions of the Attested Herd Scheme—Sir R DORMAN SMITH replied: Under the powers conferred by part IV of the Agriculture Act, 1937, a scheme is being framed whereby owners of attested herds will be assisted, by the provision of free veterinary advice and free blood-testing, to protect such herds as are already free from abortus infection and to eliminate disease from abortus-infected herds I hope to be in a position to introduce the scheme within the next few months

Smoke Abatement

Mr. DAVID ADAMS asked the Minister of Health whether he was aware that a pottery factory in Staffordshire had been converted to electric power, whereby smoke had been entirely eliminated; and what steps he was taking to induce other industrialists in the potteries and elsewhere to follow this example in the interests of cleanliness and smoke abatement—Mr. ELLIOT replied: I am aware that electricity has been used for some time with great success in certain trades in the potteries My chief alkali inspector in recent annual reports has urged the extension of the practice and has stressed the advantages of electricity and gas where available on economic terms particularly in types of industry that are normally productive of heavy smoke. I have no doubt that smoke prevention authorities and industrial organisations in this and other industrial areas of the country are aware of the possibilities of the cleaner methods, the use of which I greatly welcome

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INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 17, 1939

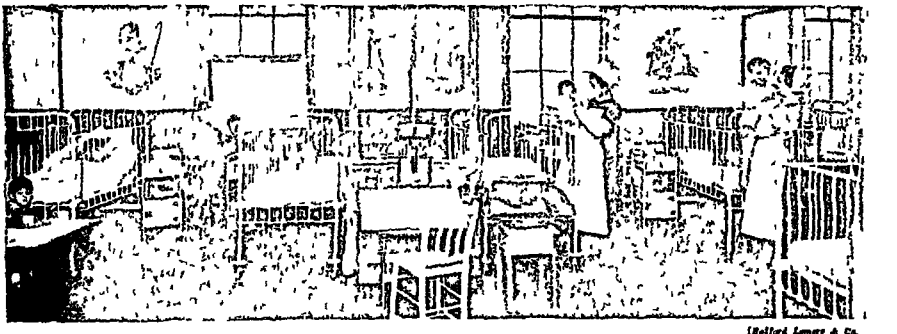
Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1549; diphtheria, 755; enteric fever, 21 (28 "expected"); pneumonia (primary or influenzal), 635; puerperal pyrexia, 185; cerebro-spinal fever, 21; acute poliomyelitis, 15; acute polio-encephalitis, 1, encephalitis lethargica, 4, dysentery, 21; ophthalmia neonatorum, 95. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 23 was 2829, which included: Scarlet fever, 659, diphtheria, 488 (carriers, 24), measles, 5, whooping-cough, 845, puerperal fever, 19 mothers (plus 9 babies), encephalitis lethargica, 304, poliomyelitis, 3. At St Margaret's Hospital there were 22 babies (plus 1 mothers) with ophthalmia neonatorum

Deaths.—In 126 great towns, including London, there was no death from smallpox or scarlet fever, 1 (0) from enteric fever, 2 (0) from measles, 14 (3) from whooping-cough, 17 (2) from diphtheria, 30 (9) from diarrhœa and enteritis under two years, and 14 (1) from influenza. The figures in parentheses are those for London itself.

York reported the only death from typhoid Birmingham had 2 deaths from whooping-cough Fatal cases of diphtheria were scattered singly over 15 great towns, Liverpool reporting 3. Birmingham had 3 fatal cases of diarrhœa

The number of stillbirths notified during the week was 218 (corresponding to a rate of 32 per 1000 total births), including 26 in London.

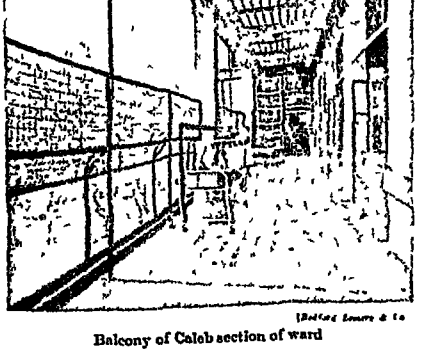


[Bedford Lemere & Co.

Part of Diplock section of ward

NEW CHILDREN'S WARD AT GUY'S

THE allocation of £21,000 from the estate of the late Caleb Diplock has made possible the construction of a children's ward at Guy's commemorating his name The new ward is now completed and is one of which any hospital in the world might well be proud, and it is particularly appropriate that Dr H C Cameron should have been invited to remain on the active staff for two years after the normal age of retirement in order to see fittingly housed the department he has built up The ward occupies the site of the old Bright ward in Hunt's House, and has been reconstructed to provide 47 cots or beds, of which 18 are surgical, 28 medical, and 1 is for the infant of a nursing mother, 10 of the cots are available for paying patients, in order to help meet the increased running expenses of the ward The ward consists of two main sections (surgical and medical) separated by a main hall A 10 ft covered balcony, with a glassed-in playroom for older children at one end, runs the length of the sections facing on to the park, and the windows on this side open to the floor to allow each bed to be wheeled straight out of doors From the central hall, which is available for demonstrations, sorting linen and so on, open the two sisters' rooms, the kitchen, milk laboratory, pantry, and autoclave room, and the children's operating theatre and anæsthetic room



[Bedford Lemere & Co.

Balcony of Caleb section of ward

Both the medical and surgical sections are subdivided into a number of wardlets by glass partitions 6 ft 9 in high, the larger wardlets contain 6 cots, and the smaller 4, 3 or 2 cots An isolation cubicle glassed to the ceiling and having a separate bath and sluice is available for infectious cases A particularly valuable feature is a small flat for a nursing mother to live in when her baby has to be admitted either for operation or for medical or feeding difficulties There is a consulting room for history taking and the keeping of records

Each wardlet is provided with a large hand basin, suitably placed and shaped for use as an infant's bath, thus obviating any need for removing infants elsewhere for their toilet Labour saving devices include a bottle-washing machine, fixed bedpan sluices and steriliser, an autoclave for infants' feedings, and panel heating in the ceiling with thermostatic control for maintaining the temperature of the ward at 65° F Perhaps the most obvious attraction of the ward is the light green and primrose tiling of the walls, into which are set coloured nursery rhyme designs Each wardlet is fitted with concealed floor lighting and dimming devices on the overhead centre fittings, an advantage in dealing with sleeping children at night

The ward will be a blessing to the children of "the Borough," and will give lasting satisfaction to the many Guy's men who have long felt its need

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YORKSHIRE TUBERCULOSIS SOCIETY.—This society, which was resuscitated two years ago, under the presidency of Dr N Tattersall, has just completed the session with an annual meeting held at Killingbeck Sanatorium by invitation of Dr W Santon Gilmour At the four meetings held during the winter: (1) Dr Peter Edwards read a paper on methods of obtaining complete collapse of the lung and demonstrated the results of adhesion-cutting (2) Dr John T Ingram proved that, in spite of the chronicity of the lesion, there is great hope for lupus if patient and persistent treatment is carried out (3) In a paper on the pros and cons of arthrodesis, Dr H L Crockatt professed a conservative attitude although agreeing that cases of non bony union should be assisted by open operation (4) Short papers on the diagnosis of abdominal tuberculosis in children (Dr Margaret Sharp) and cases of transient positive sputum (Dr S P Wilson) provoked lively discussion

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

A MUSEUM OF HEALTH

AT a ceremony in the Hall of Man at the World's Fair on June 17 a new American museum of health was dedicated before an audience of several hundred doctors and public-health officials. Dr. Livingston Farrand, president-emeritus of Cornell University, took charge of the proceedings and introduced a series of distinguished speakers, all of whom emphasised the importance of health education in forwarding the cause of public health. Prof Abel Wolman, the president of the American Public Health Association, did so by drawing attention to the backwardness of the United States in applying the discoveries of science He pointed out that although it is an accepted axiom that the individual is the first line of defence against disease, America has the distinction of leading the civilised countries of the world in smallpox, a disease from which the individual can be completely protected. The organisms of tuberculosis and syphilis were discovered many years ago, yet, though progress has been made in controlling tuberculosis, the progress of our campaign against syphilis has been blocked not by scientific ignorance but by social prejudice The American people are not so healthy as they have a right to be, and in fact public health has never been the first consideration of the state except in times of disaster. Other speakers dwelt on the possibilities of the exhibit surrounding them in the Hall of Man Dr. John L Rice estimated that four million out of the seven and a half million persons of New York city would visit the fair, and asked his audience what it would mean to the city if each of them should carry even one idea from this exhibit into their daily life But the exhibit of the fair is to be only the beginning A permanent museum housed in the city of New York with its continuous exposure to the population will result in a still greater cumulative effect Mayor LaGuardia, twitting Dr. Wolman on his pessimism, prophesied that if he were allowed to continue his programme for sanitary housing, nurseries for poor children, and nourishment for the unemployed, tuberculosis would be eliminated in New York city in the next 25 years. But if this end is to be achieved, the responsibility of the government for public health must be recognised. He announced his intention of building a new court-house for the Appellate Division and said that the present fine building at Madison Avenue and Twenty-fifth Street would then be converted into a home for the Museum of Health.

NATIONAL HEALTH BILL

Last month expert medical evidence was offered before a subcommittee of the senate committee which is considering the Wagner National Health Bill Dr Arthur W. Booth, who represented the American Medical Association, expressed the opinion that the enactment of this measure "would prove a costly mistake, jeopardising the welfare of the people and seriously compromising the future development of the science and art of medicine in the United States" He said that the projects embodied in the bill had been devised by federal officials and that they do not represent the wishes of the people The house of delegates in September, 1938, recommended the establishment of a federal department of health with a secretary as its head The bill provides no such centralisation of authority. The house of delegates also required that expansion of health services should not include provision of medical care, which can be successfully provided by the general practitioner The bill does not, in Dr Booth's opinion, provide any safeguards for the existence of the private practitioner. The bill does not limit expansion of hospital facilities to situations in which need exists nor does it limit the provision of medical care to the poor Dr. Booth felt that the federal bureaus were given too much power over the states, but when Senator LaFollette asked him to indicate the specific powers to which he objected he replied that he had not read the entire bill.

Dr. Richard M. Smith, chairman of the Committee of Physicians for the Improvement of Medical Care, urged the need for coördination of all kinds of medical care under a single administrative authority, aided by a single advisory council. In the organisation of medical care, he said, it is important that public health services should be under the control of trained full-time salaried experts The needy should become eligible for medical care without delay or indignity. Provision should be made for the support of education and investigation.

Prof John P. Peters, secretary of the Committee of Physicians, said that the committee is in general sympathy with the bill. They are interested in strengthening the machinery which can guarantee a high quality of medical care, for this will also protect the public against excessive expenditure. In his opinion the bill is intelligently conceived to meet a demonstrated need The increased costs of medicine arise not from the rapaciousness of physicians but from the nature of modern medicine Government aid is made imperative The bill wisely leaves development and administration of programmes to the several states; it is equally wise in providing that federal authorities shall prescribe standards of qualifications for the receipt of grants in aid.

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

NATIONAL HEALTH INSURANCE

THE editor of *Medical Topics* has admirably expressed the situation of national health insurance in Australia "National insurance has Cheyne Stokes breathing Signs of approaching death are evident in the act, but no one in the government has sufficient courage to put the poor thing out of its misery"

For some time it has been evident that the Australian government wants to abandon the National Health and Pensions Insurance Act placed on the statute book last year; but, national insurance being one of the main points upon which the last election was won, such action would require considerable courage—in spite of the almost national feeling against the act—which the government, in an already precarious position, has felt unprepared to show In March it decided to substitute a medical service plan repealing the pensions provisions and leaving only a system of health insurance and family medical benefit It was intended to continue the approved society system and the cash health benefits on substantially the same scale as originally provided, but the whole question of medical benefit was to be discussed first with representatives of medical benefit organisations and of the medical profession and later with the consultative council of approved societies

This substitution of a health service for the original scheme was introduced only at the expense of the

resignation of the attorney general Mr R G Menzies Now, after the sudden death of Mr J A Lyons, Mr Menzies has been recalled as prime minister to lead a new cabinet It is doubtful, however, whether this shift of power will make any significant change in the attitude towards insurance Having so strenuously opposed its abandonment several months ago, Mr Menzies no doubt feels it incumbent upon him now to make a further attempt to save the scheme He has promised to ask parliament to set up a committee of members with whom will be associated representatives of the medical profession and approved societies and the National Insurance Commission, "to see whether a practical scheme, in which all parties will cheerfully and patriotically coöperate, can be evolved"

Appearances, however, are all against the continuance of national insurance It has been officially announced that it is impossible to bring the health scheme into operation on Sept 4—the date to which it was last postponed, the National Insurance Commission's activities have been largely suspended, the approved societies have been instructed not to proceed with any further plans, and the royal commission on doctors' remuneration has not been reconstituted since the death of its chairman, has not made a report, and so far has been obviously unable to reach a basis which would ensure the coöperation of the medical profession

THE NEW ZEALAND POSITION

In New Zealand the question of insurance has taken on a rather different, though equally difficult, complexion The Social Security Act, 1938, officially began to operate on April 1, but a deadlock persists between the government and the medical profession, and of a possible 750 only 22 practitioners have accepted contracts under the act

The act entitles every man, woman, and child ordinarily resident in New Zealand to certain benefits, including pensions, unemployment insurance, medical, hospital, and maternity benefits, and the supply of medicine and appliances Supplementary benefits will be introduced later, such as specialist and consultant, radiological and laboratory, home nursing and domestic, and optical and dental services The act ensures adequate services in sparsely populated or isolated areas Provision has been made for the immediate institution of a health education campaign, and the scope of medical research is to be extended The government has given its assurance that the professional standard of medical men and others giving service has been safeguarded, that care has been taken not to disturb the personal relationship between doctor and patient, that all citizens have the right to make a free choice of doctor, and that every doctor will have an opportunity of participating in the service

However, in spite of these assurances, and since the date on which the act was to come into force, the New Zealand branch of the British Medical Association has unanimously decided that the government's scheme is inadequate and unacceptable, and that its members are unable to coöperate in its administration, being completely opposed to the present scheme, which offers all the people part or limited medical service, as against the association's view that a free complete service should be provided for those unable to pay for it

Commenting on this attitude, the prime minister has stated that the government, in introducing this legislation, was complying with the wishes of the people—at last year's election the government was returned with an overwhelming majority almost entirely on the question of social security—and that it would therefore make the best arrangements possible to give effect to those wishes If the profession, under the leadership of the B M A., was determined to persist in its policy of opposition, the government would have no option but to alter the whole basis of service and to proceed reluctantly with the establishment of a state medical service to administer the benefits of the Social Security Act The position is serious for the profession Ultimately, however, it must be the people who determine what form of medical service they shall receive In New Zealand it appears they are strongly in favour of a universal insurance scheme, and it behoves the profession to make the best possible arrangements in the circumstances

LETTERS TO THE EDITOR

PROBLEMS OF DECLINING FERTILITY

SIR,—We should be grateful if we might be allowed to draw the attention of your readers to an inquiry into the causes of infertility which is being promoted by the committee to which we belong These causes have been much discussed of late in Parliament and elsewhere It will be recalled that the main object of the Population Statistics Act, which came into effect on July 1, 1938, was to throw further light upon this subject

But there are strict limits to what we may learn from vital statistics They can tell us nothing, for instance, about how many marriages are involuntarily sterile or sterile by design, nor of the extent to which abortion and contraception are practised, nor about the numerous motives which restrict parenthood in different regional and occupational groups These problems can only be clarified by direct inquiry

A questionnaire has been prepared by our committee If filled in on a large enough scale it will yield information which is otherwise unobtainable It has been designed for the use of doctors, midwives, nurses and other competent investigators and has been drawn up on the same general lines as were followed by Prof Raymond Pearl in his comprehensive American inquiry The committee is anxious to obtain records of the attitudes and experiences of as large a sample as possible of married women in this country irrespective of age and parity

We should therefore be very grateful if those of your readers who are interested in the problems of *declining fertility*, or in problems allied thereto, would assist the committee by sending for copies of its questionnaire and by filling them in when appropriate occasions present themselves An honorarium of 1s per filled in questionnaire is offered A small manual has been prepared which provides guidance in the use of the questionnaire Will those of your readers who are interested kindly communicate with the secretary of the Population Investigation Committee, 69, Eccleston Square, London, S W 1

We are, Sir, yours faithfully,

CARLEY HOLLAND,
HENRY BRACKENBURY,
HORDER,
C P. BLACKER

June 25

BLOOD FOR THE SERVICES

SIR,—All those engaged in the present emergency in the organisation of blood-transfusion services in this country would, I think, welcome further information as to the proposed Army blood-transfusion service referred to in your annotation of June 17 For this service it is apparently proposed to draw upon the civilian population for blood for use by the Army. Yet the need of the civil population for blood for purposes of transfusion may, on occasion at any rate, be at least as great as that of the Army.

The need for a nation-wide blood-transfusion service capable of expansion on the outbreak of hostilities is obvious; local effort mainly centred around the voluntary hospitals and without support from any central authority is in many areas doing its best to meet this need If public funds and the blood of the general population are to be made available for maintaining a blood-transfusion service it seems eminently desirable that it should be for the benefit of all classes of the population, civil and combatant alike.

I am, Sir, yours faithfully,

S. C. DYKE.

Pathological Laboratories, Royal Hospital, Wolverhampton, June 24

DÉBRIDEMENT AND DÉBRIS

SIR,—My attention has been drawn to the fact that the use of the word *débridement*, in my article last week on the closed treatment of war fractures, is likely to lead to some confusion. The word is the French technical term for incision with opening up of the fascial planes and has no relation to the word *débris*. Where removal of dead or dying tissue was intended I added the words "and excision"

I am, Sir, yours faithfully,

Eton Avenue, N W 3, June 26. J. TRUETA.

THE PROBLEM OF MEDICAL LITERATURE

SIR,—There is much truth in what Professor McDowall writes The present state of medical literature is disheartening, but I think it is too pessimistic to assert that there is no prospect of improvement. There is no doubt about the need for greater coördination between medical libraries. Actually librarians do consult and help one another to a considerable extent in an informal manner, and this coöperation is likely to increase Though various journals may be "scattered all over the libraries of Britain" it is easy to find out where each journal is situated, and at slight expense obtain a photostatic copy of any particular article; it is likely that in the near future microphotography will greatly increase the facilities for such dissemination of knowledge.

It is clearly impossible for every library to take in every medical journal, and if the necessary knowledge is to be made available there appear to be two remedies at our disposal One is that suggested by Professor McDowall—the publication of a medical abstracting journal, supplemented perhaps by occasional systematic reviews; this would be a great help but would not absolve the student from referring to original articles. The second and in my opinion a complementary step would be the maintenance of at least one large library where all the rarer and more expensive books and journals could be taken; this library ought to work in close coöperation with all other medical libraries, and would need to have a special staff for the work of preparing references and translations, and be equipped with the latest apparatus for photostatic and micro photographic reproduction.

This is the ideal which the library of the Royal Society of Medicine, within the limits imposed upon it, has tried to approach; but it is clear that complete success could not be achieved by any library without endowment.

I am, Sir, yours faithfully,

Harley Street, W 1, June 26 V. ZACHARY COPE.

SIR,—Anyone with practical experience of the matter can hardly do other than agree with Professor McDowall and Mr Lloyd No real solution to the problem will be found however until the enormous output of periodical medical literature is reduced by some such drastic measures as those proposed in your recent leading article on micro-films (April 1, p 765) With regard to a medical abstract journal it might be instructive to know the reasons for the early decease of *Medical Science: Abstracts and Reviews*, which was published by the Medical Research Council from 1919 to 1925

That medical librarians themselves are becoming alive to the need for closer coöperation is shown by the existence of two recently initiated schemes The first is an ambitious one organised by the university and research section of the Library Association. A list of all known medical periodicals, of which there are probably about 7000, is being compiled on specially printed cards on which a place is provided for recording the holdings of all scientific libraries in Great Britain and Ireland that possess medical periodicals This is a large task and may, quite probably, take years to complete The next step will be to persuade the library committees of the various institutions to cancel redundant subscriptions and, with the money thus saved, to buy other periodicals not at present available

The second scheme is limited to London and for the present is confined to the four medical libraries of the Royal College of Surgeons, University College, the London School of Hygiene and Tropical Medicine, and the Medical Research Council A union list of current periodicals has already been compiled and the four librarians have agreed, in cases where there is unnecessary duplication, which subscriptions they will recommend to their committees for cancellation

The success of all such schemes depends upon the willingness of library committees or other responsible authorities to allow inter-library loans and to sacrifice certain subscriptions. Unless libraries that possess a certain journal are willing to lend it to those that do not, it is obvious that these will not cancel their subscriptions, and unless these other libraries are willing to cancel their subscriptions to redundant journals, there will be no money available for new subscriptions. I should like therefore, through your columns, to appeal to any readers, who may find themselves in a position to exercise authority in such matters, to take the long view and give favourable consideration to any proposals for coöperation on the lines suggested above

I am, Sir, yours faithfully,

CYRIL C. BARNARD,
Librarian, London School of Hygiene and Tropical Medicine

Keppel Street, W C 1, June 26

LAY PSYCHOTHERAPISTS

SIR,—My committee have instructed me to ask the hospitality of your columns for the purpose of clearing up a serious misunderstanding which seems to exist among medical men about the aims and objects of the Guild of Pastoral Psychology

The guild desires to equip ministers of religion with sound psychological training so that they may better perform their pastoral duties It is not attempting to create a class of non-medical persons who would conceive themselves qualified to practise quasi-medical psychotherapy It envisages as its typical "fellow" a man who holds a cure of souls and who carries out the duties thereof more efficiently by reason of a training in psychology The guild considers that any minister who wishes to practise professionally as a psychotherapist should conform to the standards to be laid down by the British Medical Association and does not itself at present offer a training to such persons

Quite clearly, no medical man would wish to claim a monopoly over the whole field of psychology There is educational psychology, there is commercial psychology, there is industrial psychology—and there is also pastoral psychology The guild exists to define the limits of pastoral psychology, and the medical members of its committee are there to help it to ensure that pastors do not unwittingly infringe on the province of medical psychology

I am, Sir, yours faithfully,

BERNARD C EVANS,
Secretary

Broadbent Street, W.1, June 23

MEDICAL NEWS

University of Oxford

On June 21 the honorary degree of doctor of science was conferred on Sir Edward Mellanby, F R C P, F R S, secretary to the Medical Research Council

The John Malcolm Mitchell scholarship, to be competed for by daughters of professional men will become vacant in October, 1940 Particulars may be found in our advertisement columns

University of Cambridge

At recent examinations the following candidates were successful —

THIRD EXAMINATION FOR M B and B CHIR

Part II Principles and Practice of Physic Pathology and Pharmacology—P S Adlam G N Allen Williams R H Armin J Aspin D M Baker G C Barron J R Bolton J F Buchan H Burkinshaw D L Caldwell N G Clegg, M A A Cochemé R I G Coupland O J Curl J H Dean A A P Dick H J Dismorr K C Dixon R H Elphinstone, J F Erskine T Fenwick, A D Fisk W J D Fleming C M Fletcher, R Fletcher J H P Gauvain, I O A Gibbens, M O J Gibson O D Gilmore, J A Glover I R S Gordon, G S Graveson A Hargreaves, G W Harps, K M Hay, J M Holford W F Holman R M Howitt P W Isaac N M Jackson W H Kirkaldy Willis A M Lewis G M Lewis, J A Lorimer F M McGown K S MacLean P D MacLellan N D M Melville N E Montemuis E P Morley J M Naish J O B Nesfield R O G Norman J C R Nuttall-Smith A M Ogilvie L D Osler, J N Pattinson J H Penrose C P Petch, A. Ponder R W Powell, L M Reid W H S St John Brooks P D Samman, M. Savory, M J Scott, P D Scott J R Squire, A Standeven, A J S R Tawse P S Thorne C M Wade H R L Wallis, W H C Watson G C Wells H W Whittingham, R Wilson, and P N Witney

University of St Andrews

At recent examinations the following candidates were successful —

FOURTH EXAMINATION FOR M B, C H B

R M Bell J M Berry, John Black K G Broadbent J S Brunton John Cameron J M Cathro (with commendation), Elizabeth L Dodds, J M Duncan A C Fraser Elizabeth S Harrison L O Hodgson W F F Immelman R S Kennedy, R. T Kiddie, Peter Kinnear (with commendation) Douglas Latto H L Lillie A R T Lundie Elizabeth T McDougall, W T McGinness (with commendation) Winifred I McNicol (with commendation) E G McPherson D J Macrae D S Milne Charles Milne, Freda C J Nicoll R A Philp D V Porter, G H Rea G W Taylor, B S Tulloch (with distinction), Kathleen S Turner W A Whyment, J S Young and John Young

EXAMINATION FOR B D S

I M B Allan F A Haxton R S Henderson J L Hutton, and R P McGlynn

Botleys Park Colony for Mental Defectives

The new buildings, which are situated in 300 acres of parkland and have accommodation for 1200 patients of either sex, with provision for an additional 300, were declared open last Saturday by Lady Henriques wife of Sir Philip Henriques, *chairman* of the Surrey county council The hospital, built mainly of fireproof materials, cost £630,000, and consists of 21 residence houses for patients, together with a recreation hall with seats for 750, administration and stores buildings workshop kitchen, laundry, and school premises The eighteenth-century manor is being used as a nurses' home

Prizes at Glasgow

The senate of the University of Glasgow announces that the Struthers gold medal and prize has been awarded to George M Wyburn, D Sc, M B, F R F P S G, F R S E for an important series of embryological studies embodied in papers published in the *Journal of Anatomy* in January, 1937, April, 1938, and January, 1939 The Harry Stewart Hutchison prize has been awarded to James Holmes Hutchison for his dissertation entitled the iron-deficiency anæmia of childhood

Short Service Appointments in the Navy

The Admiralty announces that the following have received appointment as surgeon lieutenant, R N, for short service P W Edmondson M R C S, L A Penn, M R C S G N Reed, M B, J K Salmon, M R C S, and F B B Weston, M R C S

Extension of Harrogate Baths

Harrogate's new £100,000 spa extension scheme will be opened by the Lord Mayor of London on Monday, July 10 The new scheme provides for an entirely new building in which exclusively Harrogate mineral water treatments will be administered The equipment of the building and the treatment apparatus are said to be the last word in spa technique The capacity of the new building will be a thousand treatments a day In addition a new lounge hall has been constructed for the recreation of patients undergoing the cure Between the new building and the lounge hall is a fountain court surrounded by a covered colonnade, heated, and enclosed in glass shutters in winter, where patients may take gentle walking exercise while drinking the spa waters, and between the periods of treatment

A Postgraduate Class in Dublin

Our Irish correspondent writes A postgraduate class on for Ireland at least novel lines is just concluding a fortnight's work in Dublin It was novel in that it was organised as a co-operative undertaking by the entire ten general clinical hospitals of Dublin, each hospital acting in turn as host for one day It differed also from previous postgraduate courses in Dublin in that the tuition was entirely clinical, the medical schools as distinct from the hospitals taking no part in the course The experiment has proved a success as far more graduates entered for the course than had been expected—over 70 in all This degree of popularity was in fact embarrassing as the numbers were too large to render clinical demonstration easy It became clear that if the class is to be repeated in future years it must be divided into manageable groups The members of the class and their teachers dined together in the Royal College of Surgeons last Saturday evening under the chairmanship of Mr William Doolin, president of the College There were no formal speeches, but the members of the class, on the invitation of the chairman, offered criticisms and suggestions on its future management An interesting and instructive discussion followed which should help the development of postgraduate teaching in Dublin

Guy's Hospital

Applications are invited for the Astley Cooper studentship which is tenable at the hospital Particulars will be found in our advertisement columns

Mental Hospitals Association

The twenty-first annual meeting will be opened by the Lord Mayor of London in the council chamber of the Guildhall at 11 A.M. on Thursday, July 6 A discussion on the Matrimonial Causes Act, 1937, in relation to mental hospital practice will be opened by Dr. T C Graves, chief medical officer to the Birmingham mental hospitals committee

Appointments for Patients at St. Thomas's

St Thomas's Hospital has introduced a system by which outpatients are seen by appointment. So far only old cases have been catered for but the results have been so encouraging that the system is likely to be extended to new cases as well The report of the almoners' department foresees the time when "the mere idea that patients, except in an emergency, should come up to a hospital without an appointment will be regarded as fantastic"

Royal Medico-Psychological Association

The annual meeting of this association will be held at Brighton, on July 12, 13, and 14, when the new president, Dr. Helen Boyle, will give an address entitled Watchman What of the Night? and the principal subjects for discussion will be early treatment for mental and nervous disorders, and epilepsy from many aspects Tickets for the annual dinner may be obtained from the secretary, 11, Chandos Street, W 1.

Order of St. John of Jerusalem

The following appointments to and promotions in the Venerable Order of the Hospital of St John of Jerusalem have been sanctioned by the King —

As Knight—Urban Marks, M.R.C.S.

As Commander—Lieut.-Colonel Frank Romer, M.R.C.S., Sir Henry Gauvain, M.D., Francis Carr Bottomley, O.B.E., M.D.

As Officer—Henry George Ramsbottom, L.R.C.P.E., Norman Harold Kettlewell, L.M.S.S.A., L.D.S., Ernest Joseph Burnett, M.B.E., M.R.C.P., David Henry Griffiths, M.R.C.S., Gwilym Llewelyn Pierce, L.R.C.P.E., Robert James Clarke, M.B., Lieut.-Colonel Edward Slade Goss, M.C., M.R.C.S., I.M.S., Francis Joseph Bach, M.D., John Craven Glen, L.R.C.P.E., Major Eben Stuart Burt Hamilton, M.C., M.B., Eric Hoerman, M.B., Andrew Croll, M.D., F.R.C.S.E., Edwin Francis White, F.R.C.S., Major Colin Wilson, M.B., R.A.M.C., Charles Paul Gaboury, M.D., Clarence John Archibald McKillop, M.D., Major Wilmot Edward Lenox Sparks, M.D., Lieut.-Colonel Ronald Herbert Candy, C.I.E., M.B., I.M.S., Lieut.-Colonel Norman Briggs, M.R.C.S., I.M.S., Mrs Jane Pasley Hay Graham Brown, M.B.

Exhibits at the National Physical Laboratory

At the annual inspection of the laboratory on Tuesday last the special exhibits included photomicrographs and radiograms illustrating the structure of teeth It has been found that there is a gradual decrease in the degree of calcification from the outer to the inner surface of the enamel The inorganic constituent of the enamel has recently been proved to consist mainly of hydroxy-apatite, the crystals of which have an average dimension of 10–8 cm and are associated into prisms containing perhaps half a million crystallites The crystalline orientation deduced from radiographic appearances has been confirmed by the polarising microscope, which shows that within each prism, which extends from the dentine to the outer surface, there are in general two groups of crystallites, the one inclined at about 5° to the prism axis and the other at about 40° The primary objects of this investigation, undertaken for the Medical Research Council, are to determine the structures of the enamel and of the underlying dentine and to observe how these structures vary with different types of teeth Other exhibits of medical interest included apparatus designed for testing the accuracy of the colour of standardised tubes used in haemoglobinometry and apparatus for testing the accuracy of glass butyrometers used in determining the percentage of fat in milk.

Medical Diary

July 3 to July 8

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W 1

TUESDAY—5 P.M., annual meeting

THURSDAY

Surgery—8.30 P.M., Dr D W G Murray (Toronto): Heparin in Thrombosis and Embolism, Venous Grafts in Blood-vessel Surgery Film. the formation of a thrombus

EDINBURGH MEDICO-CHIRURGICAL SOCIETY

WEDNESDAY—8.30 P.M. (at the hall of the British Medical Association, 7, Drumsheugh Gardens), Mr Laurence O'Shaughnessy: Surgical Revascularisation of the Heart

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W 12

TUESDAY—4.30 P.M., Sir Arthur Hall. Meningitis and Acute Infections of the Central Nervous System

WEDNESDAY—NOON, clinical and pathological conference (medical) 2 P.M., Prof J H Dible The Pathology of Liver Disease 3 P.M., clinical and pathological conference (surgical)

THURSDAY—2.15 P.M., Dr Duncan White: radiological demonstration 3.30 P.M., Dr A. A Moncrieff: Hygiene of the Newborn Child

FRIDAY—2 P.M., clinical and pathological conference (obstetrics and gynæcology) 2.30 P.M., Mr J B Hume Hernia and its Treatment

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations

ST GEORGE'S HOSPITAL, S.W 1.

THURSDAY—5 P.M., Dr A B Stokes: psychiatric demonstration

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W.C 1

THURSDAY—2 P.M., Dr Wilfred Sheldon. Cow's Milk and its Modification in Infant Feeding 3 P.M., Mr Eric Lloyd Diseases of the Hip-joint in Children

Outpatient clinics daily at 10 A.M. and ward visits at 2 P.M.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.

MONDAY to SATURDAY—All Saints' Hospital, Austral Street, West Square, S.E 11, afternoon course in urology

Appointments

BRITTON, C J C, M.D N.Z., pathologist to the Samaritan Free Hospital for Women, N.W 1

BURKITT, DENIS, F.R.C.S.E., resident surgical officer at the Prince of Wales's Hospital, Plymouth

CLARKSON, J R, B.Sc Lond., consulting physicist to the Royal Northern Hospital, N 7

COGSWELL, A P L, M.B Lond., assistant deputy coroner for Central London

HAMILTON, ALISON M, M.B Edin., assistant bacteriologist in the public health laboratory, King's College, Newcastle-on-Tyne

KANDER, H S, M.R.C.S., registrar to the ear, nose, and throat department, Queen Mary's Hospital for the East End, E 15

LAMBERT, V F, Ch.M Manc., honorary assistant aural surgeon to the Manchester Royal Infirmary

LYTH, CONSTANCE, M.F., M.B Manc., resident medical officer at the Royal Manchester Children's Hospital

MEADOWS, S P, M.D., M.R.C.P Lond., honorary assistant physician to the Maida Vale Hospital for Nervous Diseases, W 9

NATHAN, H A, M.R.C.S., temporary assistant medical officer, Epsom

NORRISH, R E, F.R.C.S., assistant surgeon to the Albert Dock Hospital, E 16

WEBB, W L, M.B Lond., temporary assistant medical officer of health for the city of Westminster

Carshalton and District War Memorial Hospital—The following have been appointed honorary medical officers—

BLOOM, HAROLD, M.R.C.S.,
DRURY, E W, M.B Leeds, and
MAITLAND, H L C, Ch.M Sydney

Glasgow Corporation—The following have been appointed assistant medical officers to the police force—

BLACK, JOHN, M.B Glasg.
FITZ SIMONS, A B, M.B Belf. and
WALKER, R N, M.D Glasg.

Examining Surgeons under the Factories Act, 1937: Dr E C HARBOTTLE (Montrose District, Angus), Dr R. C B HALL (Llansawel District, Carmarthen), Dr A R MCWHINNEY (Stratford-on-Avon District, Warwick), Dr D W D MACLAREN (Golspie District, Sutherland)

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Infirmary —Asst M O in X ray and radium depts £350
Beckenham Bethlem Hosp, Monks Orchard, Eden Park —Res H P, at rate of £150
Belfast, Forster Green Hosp &c Forthreda —H P, at rate of £150
Birmingham City —Jun asst M O for Rubery Hill and Hollymoor Divisions, £350
Bristol City and County —Asst M O H, £500
Bristol Royal Infirmary —Res med appts at rate of £150–£80
British Hospitals Association 12, *Grosvenor Crescent, S W 1* —Secretary £1000
British Postgraduate Medical School, Ducane Road, W 12 —First asst. in dept of medicine £300 to £600
British Red Cross Society Clinic for Rheumatism, Peto Place, N W 1 —Hon neurologist
Burnley, Victoria Hosp —H I at rate of £150
Cambridge, Addenbrooke's Hosp —H S and H S to spec depts, each at rate of £130
Cardiff, King Edward VII Welsh National Memorial Association Res M O for Glan Ely Hosp, £350
Chester City Hosp —Res M O £200
Chesterfield and North Derbyshire Hosp —Cas O and fracture H S, at rate of £225
Coventry and Warwickshire Hosp —Res M O, £300
Dagenham Borough —Deputy M O H, £600.
Derby Derbyshire Royal Infirmary —H S to ear, throat and nose dept, £150
Dewsbury County Borough —Deputy M O H and deputy school M O, £600
Dewsbury and District General Infirmary —Sen H S and second H S, £200 and £150 respectively
Dover, Royal Victoria Hosp —Second R M O £140
East Ham Corporation —Assistant M O H £500
East Suffolk, County of —Joint appointment of M O H, £500
Eastbourne, Royal Eye Hosp Pevensey Road —H S, at rate of £100 and £175
Elizabeth Garrett Anderson Hosp, Euston Road N W 1 —Asst. pathologist, £250 Med reg, £100
Essex County Council and Thurrock Urban District Council —Asst county M O H £700 asst county M O H, and M H £500
Glasgow Western Infirmary —Asst radiologist £100
Gloucestershire Royal Infirmary, &c —Asst to radiological dept, £500
Guy's Hosp, S E 1 —Astley Cooper studentship £130
Hampstead General Hosp, Haverstock Hill, N W 3 —H S and H P, each at rate of £100
Hôpital et Dispensaire Français Shaftesbury Avenue, W C 2.— Anæsthetist, £25
Hosp for Consumption and Diseases of the Chest, Brompton, S W 3 —H P, at rate of £50
Hounslow Hosp —H P and cas O, at rate of £100
Huddersfield Royal Infirmary —H S to abnormal maternity dept, at rate of £150
Ilford, King George Hosp.—Res M O, £150
Ipswich, East Suffolk and Ipswich Hosp —Radiotherapist £600
Keighley and District Victoria Hosp —First and second res M O's, at rate of £160 and £120 respectively
Kensington County Hosp Hiverton Avenue —Res asst M O, at rate of £250
Kent Education Committee —Dental surgeon, £500
Kidderminster and District General Hosp —Sen and jun H S, at rate of £150 and £100 respectively
King Edward Memorial Hosp, Ealing —Cas O and deputy res M O, at rate of £225
Kingston County Hosp, Hiverton Avenue —Res asst. M O, at rate of £250
Leeds, St James's Hosp —Res surg O, £350
Lincoln County Hosp —Jun H S, at rate of £150
Liverpool Royal Children's Hosp, Myrtle Street —Med reg, £150 Also surg reg, at rate of £150
Liverpool School of Tropical Medicine —Lecturer in parasitology, £700
London Chest Hosp Victoria Park E 2 —Med reg, £170
London County Council —Part time obstet and gynæcol £600
London Hosp E 1 —Medical asst. and registrar, £300
London Lock Hosp 283, Harrow Road, W 9 —Surg reg £100
Manchester Crumpsall Hosp —Res surg O, £400
Manchester Royal Infirmary —Radiologist for X ray diagnostic work, £1000 Res surg reg £200 Also med reg to out patient dept, at rate of £150
Mansfield and District General Hosp —H S, at rate of £150
Middlesex Hosp W 1 —Surg reg, £300
National Hosp Queen Square W C 1 —H S, £100
Newcastle General Hosp —H P and H S's, each at rate of £150
Newcastle upon Tyne Throat Nose and Ear Hosp —H S, £150
North Middlesex County Hosp Silver Street Edmonton N 18 —Jun asst M O, at rate of £240
Nottingham City Mental Hosp —Jun asst M O £540
Nottingham General Hosp —H P at rate of £150
Oldham, Municipal Hosp —Res asst M O at rate of £200
Oxford Lady Margaret Hall —John Malcolm Mitchell scholarship £40
Plymouth City —Public vaccinator
Pontefract General Infirmary and Hyles Hosp —Sen res surg O, at rate of £175 to £200
Portsmouth, St James Hosp for Nervous and Mental Disease, —Locum tenens asst M O 7 guineas a week
Preston and County of Lancaster Royal Infirmary —H P £120
Princess Elizabeth of York Hosp for Children Shaftesbury Av —Cas O, at rate of £125
Queen Charlotte's Maternity Hosp Marylebone Road, N W 1 —Sixth M O for antenatal dept
Reading Royal Berkshire Hosp —H S to spec depts at rate of £150
Romford Oldchurch County Hosp —Asst res surg, £350
Romford Isolation Hosp —Jun asst M O £250
Royal Cancer Hosp Fulham Road S W 3 —Res M O, £200
Royal National Orthopædic Hosp 234 & Portland Street W 1 —Surg reg for country branch £300 Also two H S's for country branch, each at rate of £150
Royal Naval Medical Service —Medical officers
Royal Northern Hosp, Holloway N 7 —H P and obstet H S, each at rate of £70
St Mark's Hosp for Cancer, &c, City Road, E C 1 —H S, at rate of £120
St Paul's Hosp for Urological and Skin Diseases Endell Street, W C 2 —Hon urological and cancer registrar Hon asst surgeon in urological dept Also radiologist £100
St Thomas's Hosp, S E 1 —Hon director of radiotherapy dept Also two physicians in charge of outpatients
Salisbury General Infirmary —H S, at rate of £125
Sheffield Royal Hosp, West Street.—Res surg O £200
Sheffield Royal Infirmary —Res H S to ophthalmic dept, at rate of £80–£120
Shrewsbury Royal Salop Infirmary —Res H S, at rate of £160
South London Hosp for Women and Children, Clapham Common, S W 4.—H S at rate of £100
Southampton, Borough Isolation Hosp —Res M O, £350
Southampton County —Asst county M O, £600
Southampton County Borough —Deputy M O H, £720
Sunderland Royal Infirmary —H P at rate of £120
Victoria Hosp for Children, Tite Street, Chelsea S W 3 —H P and H S, at rate of £100 Also cas O at rate of £200
Walthamstow Borough —Asst. obstet. res M O for Maternity Hosp., £200
West End Hosp for Nervous Diseases, Gloucester Gate N W 1 —Two res H P's, each £120
West London Hosp Hammersmith, W 6 —Chief clin asst. in X ray (diagnostic) dept, £125
Worcester County and City Mental Hosp Powick —Asst M O, £350

Medical Referee under the Workmen's Compensation Act, 1925, for the County Court District of Barnsley (Circuit No 13) Applications should be addressed to the Private Secretary, Home Office, Whitehall London S W 1 before July 15 Also for the Dumbarton Sheriff Court District (Sheriffdom of Stirling, Dumbarton and Clackmannan) Applications to the Secretary, Scottish Office, Whitehall, London, S W 1 before July 17

The Chief Inspector of Factories announces vacancies for Examining Factory Surgeons at Ashby de la Zouch (Leicester) Kenninghall (Norfolk) and Penny Stratford (Buckingham)

Births, Marriages and Deaths

BIRTHS

ANNING.—On June 25, at Leeds the wife of Dr R. M Anning of Ripon—a daughter
BARTON.—On June 26 at Welbeck Street, to Dr Mary Barton, the wife of Dr Douglas L Barton of Morden—a daughter
CAPPS.—On June 19 at Park Square East, Inner London N W 1, the wife of Mr L C W Capps F R C S.—a daughter
COATES.—On June 22, at Westminster Hospital the wife of Dr Richard Coates of Edenbridge—a son
DILL-RUSSELL.—On June 25 at Nicosia Cyprus the wife of Dr P Dill Russell—a daughter
EVANS.—On June 23, at Tunbridge Wells the wife of Dr W O Evans—a daughter
KAY.—On June 23 at Sylvan Avenue Mill Hill, the wife of Dr E J S Kay of Borehham Wood—a son
KITSON.—On June 24 at Melton, Suffolk, the wife of Dr W Brooks Keith—a son
ROBERTSHAW.—On June 20, at Douglas Isle of Man, the wife of Captain G M Robertshaw, R A M C.—a son

MARRIAGES

KETTLE—DREW.—On June 24 at St Paul's Church Weston super Mare, Austin Braybrooke Kettle, M D, to Dorothy Mary Drew
LEIDHAM GRIFFN—CALDWELL.—On June 24 at St Peter's Church Burnham Bucks John Charles Leidham Green F R C S, to Gertrude Mary Somerville Caldwell M B

DEATHS

HAYLOCK.—On June 23 at Dreitwich Sydney John Haylock M R C S, of Southbourne, Bournemouth

N.B.—A fee of 1s 6d is charged for the announcement of Births, Marriages and Deaths

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VALEDICTORY.—We part this week with the senior member of the staff Mr F W White, who has been editorial secretary since August 10 1901 He has contributed to our columns many informative notes His memory goes back to the Wakley tradition and many of our contributors are unknowingly indebted to his unrivalled knowledge of medical names and terms for their immunity from painful slips and omissions All his colleagues on the staff are aware of their debt and wish him God-speed in his retirement

NOTES, COMMENTS, AND ABSTRACTS

THE PHYSIOLOGY OF MARITAL INTERCOURSE

AN INQUIRY

BY J. R. GROOME, M.A., B.Sc. Oxfd

(From the Department of Zoology and Comparative Anatomy, Oxford University)

THREE married professional men, living in the south of England, undertook to keep accurate notes of their sex-life for 15 months. Much of the data so obtained is necessarily subjective; but it was hoped that accurate detail from a small source over a long period might be of greater value than replies to a general questionnaire. Wider verbal inquiries indicate some measure of agreement in matters which are susceptible to corroboration.

This inquiry was originally intended as a study of *the prostate gland in young men; the ancillary* findings cannot form a basis for comparison with the statistical data of Pearl (1925) on the frequency of coitus, or that of Engle and Shelesnyak (1934) on the menstrual cycle, as the method of approach is different, but they may be complementary to those works.

At the beginning of the inquiry the investigators were:—

1. Age 25, wife 26, married 2 years, 0 children.
2. Age 30, wife 32, married 6 years, 1 child.
3. Age 36, wife 33, married 10 years, 2 children.

All use contraceptives.

THE MENSTRUAL CYCLE

The average length of the menstrual cycle in the wives of these three men was 25·6 days, and the average number of copulations in each intermenstrual period was 6·2. From April to September the menstrual cycle occupied 26·3 days with 7·3 copulations; from September to April it occupied 25·1 days with 5·7 copulations. That is to say, throughout the summer there was an average of one copulation every 3·6 days, and throughout the winter one every 4·4 days.

Periods of desire seem to be infinitely variable, but the three women under consideration agreed fairly well. It seems in these cases that desire is at its lowest during the 6 or 7 days preceding menstruation; it rises steeply during menstruation and reaches a peak 2 days after menstruation has stopped. Desire then decreases slightly for 4 or 5 days; it increases again in the next 4 days and reaches a second, but less intense, peak. This second peak usually occurs 14 days after the beginning of the preceding menstrual period and is presumably associated with ovulation (Horrenbergen 1928). After this desire decreases, reaching its minimum a week before the beginning of the next menses.

This variation in desire is shown graphically and arbitrarily in the figure, with the copulations of no. 2 marked on the curve. A line has been drawn separating the curve into two portions of equal duration in each intermenstrual period. Where the curve is above this threshold line it represents a period of desire; where it is below the line a period of indifference.

During the 15 months of this inquiry there was an average per married couple of 70 copulations in the desire period, and 49 in the indifferent period. From April to September there were 4·6 copulations in the desire period and 2·6 in the indifferent period of each menstrual cycle; throughout the winter the figures were 3·0 in desire and 2·7 when indifferent. This, in conjunction with the greater frequency of coition, suggests that desire in women is more intense in warm weather, which agrees with the general evidence from the tropics.

The women also report an increase in the hip, waist and breast measurements six or seven days before menstruation begins, returning to normal when menstruation ends. This can hardly be comparable to the cyclical changes in the sexual skin of primates (Krohn and Zuckerman 1937, Zuckerman 1937), for in monkeys the swelling is in the follicular phase. It is, however, possible that there are similar metabolic changes, involving the utilisation of extraneous water. In women this increase, which is associated with sexual indifference, is doubtless a corollary of pseudopregnancy. Both pseudopregnancy and the indifferent phase are terminated by menstruation.

The fact that these women experience greatest desire at a time in the menstrual cycle when conception is unlikely may lend some support to Zuckerman's theory of the evolution of the family unit.

THE SEMEN

When rubber sheaths were used the volume of the ejaculate was measured. For the purposes of this inquiry an ejaculate of less than 3 c.cm. is called small, of 3–4 c.cm. medium, and of more than 4 c.cm. large. Ejaculates of medium volume were most common.

It was found that the amount of the ejaculate was not necessarily proportional to the length of the period of abstinence preceding it, although abstinence for 7 or more days usually ended in an ejaculate of more than 4 c.cm., and ejaculates of less than 3 c.cm. usually followed three copulations in the preceding 4 or 5 days. Volume was apparently unaffected by the common cold, but was much reduced after a fever.

The semen may contain solid bodies known as prostatic concretions, which are small concentrically marked grains staining with iodine, apparently formed in the alveoli of the prostate. Sometimes they are partly calcified and are then called prostatic sand. Large squamous cells of unknown origin may also be found in semen. These bodies are collectively referred to as debris. I am indebted to Dr. J. R. Baker and his assistants for assessing the debris and counting sperms in samples from one investigator (see Baker, Ranson and Tynen 1937). They found that washed sheaths must be used if the debris is to be assessed accurately, as the concretions are almost indistinguishable from the starch grains with which sheaths are dusted.

The amount of debris is very variable in different people and also in the same person at different times. A large amount of debris is not associated with a large ejaculate, and is therefore not produced as a result of high internal pressure in the ducts and glands nor is it associated with a small ejaculate, so that it does not seem to indicate an effort by the glands to produce a certain minimum of secretion. A large amount of debris is most usually found in the normal medium-sized ejaculate.

One investigator (no. 2) normally produced 162 million sperms per c.cm. of semen. In August he

contracted a streptococcal infection akin to scarlet fever The fever lasted a week, and three weeks later, with four ejaculations intervening, the fifth ejaculation contained so few sperms and was so small in volume that the sample was useless for experimental work Unfortunately no accurate assessment of the number of sperms was made It seems, however, that a febrile illness may result in temporary sterility

In the following winter this same investigator, aged 30, endeavoured to induce sterility artificially His body-temperature taken in the groin was 36 6° C In the morning before getting out of bed his average scrotal temperature was 31 3° C , in the evening it was 33 0° C For the 5 weeks of the experiment he wore, during the day only, a suspensory bandage containing three layers of thermogene wool This raised the evening temperature of the scrotum to 35 4° C The morning temperature was also found to be higher than normal, presumably as a result of increased blood supply, the average being 35 3° C

If spermatogenesis is slowed down or stopped the number of sperms in the semen will fall in proportion to the number of ejaculations that have taken place since the inhibitory condition started Conversely, when spermatogenesis is restarted or its rate increased the number of sperms in the semen will probably increase in proportion to the time between such restarting or increase and ejaculation

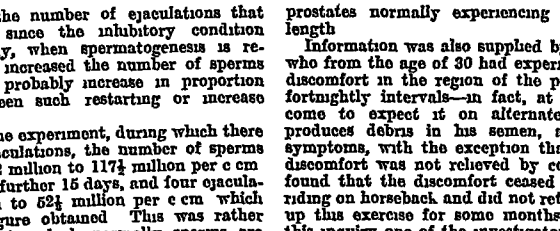
After 9 days of the experiment, during which there had been three ejaculations, the number of sperms had fallen from 182 million to 117½ million per c cm of semen After a further 15 days, and four ejaculations, it had fallen to 52¼ million per c cm which was the lowest figure obtained This was rather a small ejaculate, in which normally sperms are relatively more numerous, and represented an ejaculation of only 115½ million sperms, whereas this man's normal total is 637 million After a further 10 days and two ejaculations the number of sperms rose to 244 million per c cm and the next ejaculate in 3 days' time gave 215 million per c cm Throughout the experiment the epididymis on both sides appeared to be enlarged, but the increase was presumed to be entirely vascular

It seems from this experiment that an average increase in scrotal temperature of 1 7° C, is sufficient to discourage spermatogenesis for a short time After 4 weeks the testes become acclimatised and spermatogenesis proceeds more actively than usual Possibly more conclusive results could be obtained in the summer As bed clothes keep the scrotum more than 1° C warmer than trousers, it is possible that a non febrile disability, such as an accident which keeps the patient in bed, may result in a temporary reduction of fertility

THE MALE CYCLE

Two of the investigators experience considerable discomfort in the lower abdomen and region of the rectum from time to time The condition will normally disappear in a few hours, but may recur the next day or in two days' time It is relieved almost at once by copulation The frequency of urination is increased when this sensation is present but it is not affected by the condition of the bowel It was most marked in April, May and June It seems probable that this discomfort originates in the prostate, but I do not know whether it is normal or pathological The youngest of our three investigators never experienced it, and on wider inquiry most of the men who were asked either did not know it or would not admit to it It may only arise in prostates with a tendency to produce debris, but it was not as a rule associated with an ejaculate containing a large amount of debris

Prostatic discomfort was usually evident in investigators 2 and 3 at intervals of from 28 to 10 days, the mode being 19 days There was, however, one gap of 59 days and another of 71 days in which the discomfort was not evident These gaps are not incompatible with an ill defined cycle of 19 days, and it is suggested that they represent three and four periods respectively, which were missed, in prostates normally experiencing a cycle of this length



Arbitrary curve showing periodic variations in desire of the wife of no 2 Copulations are marked on the curve

Information was also supplied by Dr X, aged 38, who from the age of 30 had experienced fairly acute discomfort in the region of the prostate at regular fortnightly intervals—in fact, at one time he had come to expect it on alternate Thursdays He produces debris in his semen, and confirms the symptoms, with the exception that in his case the discomfort was not relieved by copulation Dr. X found that the discomfort ceased when he took to riding on horseback and did not return when he gave up this exercise for some months At the end of this inquiry one of the investigators bought a horse and the symptoms ceased when he rode; but they returned when the horse went lame and could not be ridden It has been suggested that this recurrent discomfort may be due to a vascular congestion, which is dissipated by what amounts in effect to massage, it should therefore be mentioned that investigators 2 and 3 and Dr X have no hæmorrhoidal tendencies

All three investigators reported a less acute sensation, which gives the impression of pressure in the epididymides or vasa deferentia or in both It may be bilateral or unilateral, and when present in the epididymis this organ appears to enlarge It was first noticed by one of the investigators, before his marriage, as a very acute pain in the vasa deferentia It would occur after periods of ungratified sexual excitement, such as a day spent in the company of his fiancée Since marriage, in this case, as with the other investigators, this so called spermatic colic has appeared as a mild discomfort at intervals

Spermatic colic is often associated with an ejaculate containing much debris, it sometimes accompanies prostatic discomfort, only once in the present investigation was it noticed to be associated with a small volume of ejaculate, it may arise on two

successive days in spring and summer, or with an interval of as much as 52 days in winter. Spermatic colic does not always follow abstinence, as might be expected if it is due to pressure in the ducts; in fact it often comes on at times when intercourse is frequent, but it is not possible to say that one is the cause of the other. In one case it was noted that spermatic colic was felt 18 times in the wife's period of desire and 11 times in the indifferent period. In the summer months, when desire was more apparent, it was noted 9 times in the desire period and only 3 times in the indifferent period, which suggests that its cause may not be entirely physiological.

Inquiry disclosed that spermatic colic, though not universal, is a much commoner symptom than prostatic discomfort. It is evident that the two phenomena are not associated.

A prostatic cycle, probably under the influence of the pituitary body and the testes, is not an impossibility in view of recent work on mammalian intersexuality.

SUMMARY

The marital sex-life of three young professional men was investigated for 15 months. Sexual activity was more apparent in summer than in winter.

Certain prostates seem to undergo cyclical changes occupying 2–3 weeks and involving physical discomfort. This cycle may only be noticeable in prostates producing debris; it may be pathological. Riding a horse was found to allay the symptoms.

Spermatic colic is often associated with the presence of prostatic debris, but the ultimate cause may be psychological, as the presence of debris is not universal.

Spermatogenesis is probably checked by fever. It was also checked by raising the temperature of the testes artificially, but proceeded normally when these had become acclimatised to the new conditions.

I am indebted to my three anonymous collaborators and to Dr. J. R. Baker for much helpful comment.

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MEDICAL ORATIONS

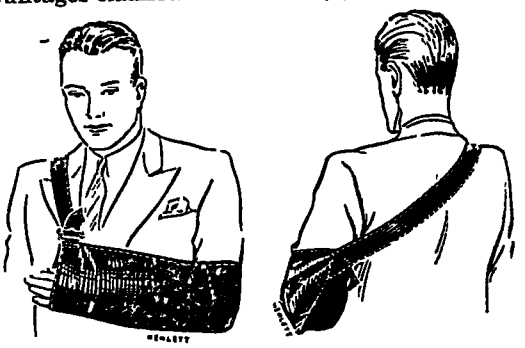
A REPUTATION as a medical orator is an unhappy possession, for at least three or four times a year its possessor must face an audience which demands an exhibition of oracular wisdom. In his "March of Medicine" (London: Humphrey Milford, Oxford University Press. 1938. Pp. 280. 12*s.* 6*d.*) Dr. Lyman Wilbur of California has collected 29 of these Delphic utterances delivered by him between 1913 and 1937. They are quite characteristic. The glowing past and radiant future of our profession are painted in the routine colours. No doubt this is what congresses like, or why should Dr. Wilbur have been called on time and again? These addresses could certainly hurt nobody's feelings, but they will leave most readers cold.

SULPHANILAMIDE IN TULARÆMIA

Dr. Henry G. Hadley, of Washington, D.C., informs us that he has noted clinical improvement in a patient with tularæmia treated with sulphanilamide. The patient, a white female, aged 29, was seen on Nov. 28, 1938, having a shallow ulcer on the right index finger with a greyish slough and associated with enlargement of the epitrochlear and axillary glands. The finger had been injured two weeks earlier while she was dressing a rabbit. The illness began four days later with sudden onset of chill and fever, and she was confined to bed for a week and treated for influenza. On Dec. 1 the serum gave a positive test for tularæmia, 1 in 27 dilution. Sulphanilamide gr. 30 was given daily from Dec. 4 to Dec. 8 and was discontinued temporarily because of a general eruption. It was started again as soon as the rash had disappeared, and from Dec. 22 to Jan. 4 she received gr. 30 daily. The enlargement of the glands had almost entirely subsided and the finger lesion had entirely healed by Jan. 4. During both periods of sulphanilamide therapy improvement was noted subjectively and objectively, and while it was discontinued the patient's condition remained relatively stationary.

AN ARM-SLING

C. J. HEWLETT & SON, LTD., send us the accompanying sketch of the "Mead" adjustable arm-sling. The advantages claimed for it are: (1) it can be used for



either arm; (2) the weight is carried by the shoulder and not by the neck; (3) it is readily adjustable by means of a non-slipping buckle; and (4) it is light and washable. Messrs. Hewlett's address is 34, Charlotte Road, London, E.C.2.

MANUSCRIPTS AND ENGRAVINGS

AMONG the manuscript treasures which Messrs. Sotheby are to offer for sale next month is a thirteenth-century copy of Albuhasim De Chirurgia, bound up with other medical works and illuminated with miniatures and drawings of instruments. It affords an example of the fleeting character of human fame, for it is by the beauty of the setting alone that Albuhasim's work has survived the lapse of ages. Great in his generation he now lives only by the patient and devoted work of an unnamed English scribe. The same train of thought is suggested by Messrs. Suckling's catalogue of engraved portraits of scientists. In their lives or after their deaths these men climbed at least the first slopes of the hill of Fame, yet to us their representations are chiefly valued not for the memorial of what they accomplished but for the beauty and vigour of the—often unknown—artist's work.

REPRINT OF HIPPOCRATES

"Adams, of Banchory (a little Aberdeenshire village), was not only a good practitioner and a skilful operator but he was an excellent naturalist. This is by no means an unusual or remarkable combination, but Adams became in addition one of the great scholars of the profession. He had a perfect passion for the classics. . . . He translated the works of Paulus Aegineta, the works of Hippocrates, and the works of Aretaeus . . . monuments of the patient skill and erudition of a Scottish village doctor." So wrote Osler in one of those papers in which he delighted to praise our forefathers. The Sydenham Society published Adams's translation of Hippocrates in 1849, and now, nearly a century later, his work has been reprinted by Baillière, Tindall and Cox in a neat volume (The Genuine Works of Hippocrates. London. 1939. Pp. 384. 13*s.* 6*d.*) which reproduces the text with few modifications, but omits much of Adams's notes and illustrations.

ADDRESSES AND ORIGINAL ARTICLES

ACUTE OBSTRUCTION OF THE SMALL INTESTINE*

BY R L HOLT M D Manc, F R C S
HON SURGEON TO THE MANCHESTER NORTHERN HOSPITAL

EXPERIENCE has proved that the treatment of acute intestinal obstruction is not merely a matter of surgical technique When the condition is recognised and treated in its early stages, the results are very satisfactory, but in the later cases, when the bowel has become damaged and systemic effects have manifested themselves, the relief of the obstruction is often not sufficient to prevent a fatal termination The fundamental importance of early diagnosis and treatment cannot be emphasised too strongly, but for a variety of reasons many cases are seen by the surgeon for the first time several days after the onset Even under modern conditions these cases have a mortality rate of about 60 per cent, and their treatment presents a most serious problem to the surgeon In one of his earlier articles the late Sir David Wilkie said that "any advancement in the treatment of acute ileus must be based on a more exact understanding of the relative importance of the various factors which make for a fatal issue in this malady" The immediate cause of death in human patients is often some obvious complicating factor, such as peritonitis or pneumonia, and the real difficulty is to explain the severe illness in the earlier stages

The causes of intestinal obstruction have been the subject of detailed study in the past, and much valuable information has been gained, but in acute obstruction the cause is not so important as the effects It is only by learning to treat the effects as well as the cause that any improvement in the treatment of obstruction is to be hoped for The local and general effects have been investigated by numerous research workers in the last twenty or thirty years, and it is now possible to give a *fairly accurate* account of the *physiopathology of acute obstruction* The object of this paper is to recount briefly the information which experimental work has provided and to indicate the lines along which this knowledge can be usefully applied in clinical practice

DEFINITION

Intestinal obstruction is divided into two types—mechanical and paralytic In mechanical obstruction the contents of the intestine are prevented from passing along by an actual obstruction to the lumen of the gut In paralytic obstruction the contents do not pass along because the intestinal muscle cannot provide the necessary propelling force Mechanical obstruction is customarily divided into simple obstruction and strangulation In simple obstruction there is a complete obstruction to the passage of the intestinal contents, and in strangulation there is, besides the obstruction of the lumen, an obstruction to the blood supply of the obstructed gut The distinction is not always clear cut Uncomplicated obstruction is rare clinically, for many cases which begin as an obstruction pass in their later stages into a condition which shows some of the elements of strangulation

OBSTRUCTION

The function of the duodenum is primarily one of secretion, whereas that of the ileum is one of absorption The volume of digestive fluids poured daily into the duodenum and absorbed at a lower level in the intestinal tract has been estimated at 5–7 litres An obstruction in the upper part of the small intestine prevents the reabsorption of these secretions, which accumulate and distend the gut above the obstruction Peristaltic activity is stimulated by the distension, and, besides causing the typical colicky pain of obstruction, the accumulating fluids are forced up into the stomach, from which they are vomited. Obstructions in the duodenum or upper jejunum are manifested by profuse vomiting, producing a continual loss of digestive secretions When the lower part of the small intestine is obstructed, the picture is somewhat different Occasionally such cases are marked by the early onset of profuse vomiting, but usually vomiting is not a feature in the early stages, because the ileum is able to absorb the greater part of the fluids passing down to it from the duodenum and jejunum If reabsorption were complete, the signs and symptoms of obstruction would be absent, but usually absorption is incomplete, and a slowly progressive distension develops The capillary and venous circulation is interfered with, giving the gut a congested appearance, there are submucous hæmorrhages, and patches of necrosis are found in the mucosa, especially on the antimesenteric border The intestinal wall becomes thickened by plasma exuded from the capillaries, and from the same source comes the plasma like peritoneal fluid The intestinal muscle, perhaps as the result of overstretching or œdema, loses its tone and contractile power, tending to produce a partial or complete paralysis of the gut immediately above the obstruction In such a way are produced the heavy thick-walled, distended, and congested loops of small intestine so often seen at operation

There are two main types of obstruction high obstruction marked by profuse vomiting and loss of fluids, and low obstruction marked by progressive intestinal distension which causes severe local effects in the obstructed gut Originally it was thought that the absorption of toxic substances from the foul contents of the obstructed loops of gut was the cause of death in all cases of obstruction There was no difficulty in demonstrating the toxic qualities of numerous substances extracted from the contents of obstructed gut, but the general application of this theory had to be limited when it was shown, firstly, that animals with a high intestinal obstruction could be kept alive for long periods by the administration of sufficient quantities of normal saline, and, secondly, that normal intestinal mucous membrane prevented the absorption of these toxic products There is general agreement among experimental workers that death in high intestinal obstruction is due not to toxæmia but to the progressive dehydration that results from the profuse vomiting Toxæmia, however, is still held by most writers to be the cause of death in low obstruction In these cases several investigators have not been able to prolong the lives of their animals by the administration of saline In low obstruction degenerative changes in the mucosa of the obstructed loops of gut are usual, and it is alleged that these changes remove the normal protective barrier Even so there is no direct evidence of such absorption Many experiments have been

* A paper read to the Manchester Surgical Society on Nov 15 1938

carried out with various readily recognisable substances, such as strychnine and methylene-blue, but the bulk of the evidence points unmistakably to the fact that, under the conditions existing in low obstruction, absorption from the intestine is actually diminished It was with the idea of clearing up this problem that most of my experiments on obstruction have been concerned. They prove conclusively that toxic absorption is not a factor in low obstruction It has been shown that animals given sufficient saline always live for three to four weeks unless the gut perforates above the obstruction and peritonitis sets in. The fact that the administration of saline in sufficient amount controlled the systemic effects of obstruction suggests that whatever these effects are they act by causing dehydration and secondary changes in the circulation

Some explanation other than toxæmia is therefore necessary to account for the severe illness of patients with low intestinal obstruction. One fact has been clearly demonstrated experimentally in these cases—namely, that if distension of the gut is prevented the signs and symptoms of obstruction do not develop. The effects of distension of the gut are as follows:—

(1) *Reflex*: (*a*) vomiting; (*b*) increase in the secretions from the intestinal glands; (*c*) anorexia; and (*d*) pressor impulses.

(2) *Local*: (*a*) stasis of blood and œdema in the walls of the obstructed gut; and (*b*) partial or complete paresis of the intestinal muscle.

The first five factors have one common effect: direct or indirect dehydration of the body tissues and reduction of the blood volume. Vomiting and increased glandular secretion tend to drain the tissues of water and salts, and anorexia prevents their replacement. The pressor impulses, by maintaining a reflex vasoconstriction, tend directly to reduce the blood volume Finally, the changes in the intestinal wall are very important. The stasis of blood in the vessels, the plasma exuded into the tissue spaces, and the peritoneal exudate remove plasma and whole blood from active circulation. The importance of this factor depends on the length of gut in which these changes are found. When approximately half of the intestine is affected, it has been estimated that the volume of blood and plasma removed from circulation amounts to 20–30 per cent of the initial blood volume

All these factors play their part wherever the obstruction is situated in the small intestine, and the predominance of one or other explains the variability of the symptoms. In obstruction of the duodenum profuse vomiting is the most pronounced symptom, and sufficient fluid and salts may be lost to cause death from dehydration. In consequence an examination of the blood shows a reduction in the chloride value and a lowering of the blood volume In low obstructions vomiting is not so profuse and may be absent for several days. It is only in those patients who vomit profusely that there is any rapid deterioration in the general condition. It is in low obstruction that the effects of the factors of limitation of intake of fluid and salts and the loss of plasma and whole blood into the distended gut are seen It is sometimes suggested that the dehydration of the patient is greater than can be accounted for by the fluid lost by vomiting and into the obstructed loops of gut. The volume of fluid normally lost daily by the average patient has been estimated to be about 4000 c.cm.: 2000 c cm. by perspiration and by vaporisation in the breath; 500 c cm. by the intestinal tract; and 1500 c.cm. by the kidneys excreting urine at a specific gravity of 1 015.

The loss by perspiration and respiration, the so-called insensible loss, continues until sufficient fluid has been lost to equal 6 per cent of the body-weight, by which time signs of dehydration are evident. In low obstruction the replacement of this fluid is quite inadequate, and, if to this loss are added the fluid lost by vomiting and into the loops of gut and the blood and plasma withheld from the circulation, it becomes evident that a very severe dehydration may result from the combined effects of these losses In my opinion these losses are the direct cause of the poor general condition of patients with a low intestinal obstruction. In some cases the effects of the severe dehydration are sufficient to cause death, but in other cases, although the patient is reduced to a very low state by the dehydration, death is due to peritonitis or such a terminal complication as bronchopneumonia.

STRANGULATION

The occurrence of strangulation adds a most serious complication to intestinal obstruction. Theoretically it is possible for both the arteries and the veins of a strangulated loop of gut to be obstructed, but in practice only the veins are obstructed The effect of such venous obstruction is that the tissue spaces become filled with red cells, the lumen of the gut is distended with a thick red exudate, and a fluid indistinguishable from plasma exudes from the peritoneal surface of the gut. The organisms in the lumen proliferate and invade the bowel wall, the tissues of which disintegrate progressively until ultimately perforation takes place. In experimental strangulation the survival period and the cause of death depend on the length of gut involved in the strangulation. The experimental long-loop strangulation is chiefly of academic interest, since strangulation of loops of such length in man must be rare. In animals the strangulation of half or more of the small intestine causes what is to all intents an acute internal hæmorrhage. This blood loss may, however, be important in certain cases of acute intussusception, volvulus, and mesenteric thrombosis Strangulation of even so-called moderate-sized loops, such as are used experimentally, in which about a quarter of the small intestine is strangulated, does not often take place in man In these cases the passage of blood into the tissues of the strangulated loop does not continue indefinitely, for after a time thrombosis occurs in the capillaries and smaller veins. Attention is turned to the fluid exuded from the strangulated loop At first indistinguishable from plasma, the fluid soon becomes darker and develops depressor qualities when injected intravenously. The depressor substance present in the early samples is akin to histamine Later the fluid becomes almost black and acquires the odour characteristic of gangrenous gut. This later exudate is very toxic and, if injected intraperitoneally in sufficient quantity, will kill normal animals The exact nature of this toxin is not known, but it is akin to the proteoses and is produced by the action of proteolytic bacteria on the tissues of the intestinal wall. In animals with a strangulation of a quarter of their small intestine the cause of death is the absorption of this toxic exudate from the peritoneal cavity. The fact that toxic substances are produced in the tissues of strangulated gut and pass into the peritoneal fluid shows the importance of handling the strangulated loops as little as possible

within the peritoneal cavity and of removing the peritoneal fluid by suction

The short loops used experimentally are similar to those which are most often strangulated in clinical practice In these cases perforation of the loop is always found at autopsy, and peritonitis is the cause of death, but perforation does not necessarily cause a widespread virulent peritonitis This is especially true when, instead of the gut perforating suddenly and flooding the peritoneum, there is a gradual seepage of the contents through the gangrenous wall of the gut This fact is illustrated by two cases from my practice which came to operation with the pre operative diagnosis of a pelvic peritonitis of uncertain origin Both patients had been ill three days before being sent to hospital. In each case about 2 ft of collapsed gangrenous small intestine was found to be the cause of the peritonitis, and both patients survived a resection and anastomosis with little apparent difficulty I do not wish to imply that the factors of blood loss into the strangulated loop and the absorption of toxic exudate are unimportant It is true that they are not the immediate cause of death in short loop strangulation, but they are present and help to undermine the general condition of the patient Most strangulations in clinical practice take place in hernial sacs The constriction at the neck of the sac and the adhesions that form there not only delay absorption of any exudate but also tend to localise the infection that follows perforation of the loop Such patients can therefore survive for longer periods than would be the case if the strangulation had taken place in the general peritoneal cavity It is in these cases with their larger survival period that the effects of the intestinal obstruction, which always accompanies a strangulation, become pronounced It is possible to recognise cases in which the effects of the strangulation itself predominate and others in which the effects of the accompanying obstruction appear the more important

TREATMENT

The two factors which adversely affect the treatment of acute obstruction are (1) delay in instituting treatment and (2) the presence of strangulation

The time factor in the treatment of acute obstruction is most important Delay allows the systemic and local effects of the obstruction to add serious operative and postoperative risks In the early case the relief of the obstruction cures the patient, but in later cases similar treatment often does not prevent a fatal result It is in the treatment of these later cases that considerable improvement is possible by applying the information which experimental work has produced In the absence of strangulation there is no toxæmia, and the poor condition of the patients is the result of the systemic effects of intestinal distension The systemic effects, apart from lowering the general condition of the patient and rendering him more than usually susceptible to postoperative complications, make administration of an anæsthetic risky It is not generally realised how great the dehydration may be, though some clinical indication of this is provided by the sunken eyes and shrinkage of the subcutaneous tissues The dehydration of the tissues is well advanced before the blood volume is reduced It is easy to be misled by an apparently normal systolic blood pressure and only slightly raised pulse rate These cases of obstruction provide some of the commonest examples of the condition that Zachary Cope has described as latent shock The pulse pressure and pulse rate may remain normal after the blood volume is considerably reduced In fact this variety of shock may be accompanied by a rise in blood-pressure which is merely an overcompensation to a circumstance which tends to cause a fall of blood pressure The whole of the mechanisms by which the body attempts to maintain an efficient circulation have been mobilised Many of these are nervous mechanisms and are easily put out of action by an anæsthetic Serious or fatal results may follow the administration of an anæsthetic unless measures are taken beforehand to restore the blood volume

When the possibility of strangulation does not enter into the diagnosis, there is no overwhelming urgency to hurry the patient into the operating theatre At least two or three hours can be profitably spent in carrying out a routine preoperative treatment In general it can be said that the more pronounced the dehydration the longer this pre operative preparation should be In the late cases the relief of the obstruction is not so important as the adoption of measures to relieve the intestinal distension and to replace some of the fluid lost If these measures are not carried out adequately, it will be found that many patients "peter out" within twenty-four hours of operation The patient should be treated along the usual "anti shock" lines—i e, thoroughly warmed with hot blankets or bottles, given an injection of morphine, and transfused with saline administered by a continuous intravenous drip About 1000 c cm of normal saline should be given to the average patient before operation, but, if more than two or three hours is taken over the preoperative preparation because of severe dehydration, the volume of saline should be increased Hypertonic saline should not be given, for its use is based on a mistaken conception of the importance of the loss of sodium chloride as the cause of the illness The stomach must be emptied, preferably by a Ryle's or similar tube, which ought to be left in position during and after the operation With such measures the patient's general condition is found to improve considerably, and operation may now be more safely undertaken The anæsthetic of choice is unquestionably spinal anæsthesia but it is only safe if measures have been taken to restore the blood volume In strangulated hernia in very old patients local anæsthesia may be preferable to spinal anæsthesia The presence of several feet of thick walled, distended, and congested gut may tempt one to perform an enterostomy, but except in rare cases this is not necessary It has been found in practice that continuous siphonage of gastric and duodenal contents through a Ryle's tube is just as effective as an enterostomy, and its use does not carry with it the very real danger of peritonitis which an enterostomy introduces Some idea of the prognosis can be gained from the state of the gut above the obstruction If under spinal anæsthesia there is a segment of gut that does not show any muscular contractions, especially when stimulated by pinching, paralytic ileus is to be expected

When strangulation is suspected, the emptying of the stomach and the administration of intravenous saline must be hastened and operation carried out as soon as possible No delay is justifiable, because of the danger of viable gut becoming gangrenous Certain precautions are suggested by experimental work The abdominal incision should be large enough to allow the strangulation to be freed rapidly The excessive manipulation of strangulated loops within the peritoneal cavity is dangerous, for it is likely to increase the amount of toxic products passing into

the peritoneal fluid The peritoneal fluid should be removed by suction while the viability of the strangulated gut is being decided. In no circumstances should gut about which there is any doubt of viability be returned to the peritoneal cavity, because of the very serious risk of perforation and peritonitis. For the same reason the oversewing of gangrenous constriction-rings in the gut is not without risk. If the patient's general condition does not warrant an immediate resection and anastomosis, the loop of gut should be exteriorised. It may be left in the subcutaneous tissues or on the surface of the abdominal wall and dealt with later

The treatment of acute intestinal obstruction does not end with a successfully completed operation. The measures begun before operation to remedy dehydration must be continued for several days after operation. One of the most serious effects of intestinal distension is the partial or complete paralysis of the intestinal muscle of the distended gut. Treated on the correct lines most of these cases settle down; but, if the gut is stimulated by purgatives and other drugs, a paralytic ileus often results. It is most important to regard and treat every case operated on for acute intestinal obstruction or strangulation as a potential case of paralytic ileus. Fluids should only be allowed very sparingly by mouth and in many cases prohibited altogether, unless continuous gastric siphonage is being carried out. Fluid is best given as normal saline by a continuous intravenous drip, but rectal and subcutaneous routes may be employed. About 4–5 pints daily is usually sufficient for an adult. Purgatives and drugs which normally stimulate peristaltic action are contraindicated The habitual use of such drugs as Pituitrin, eserine, and acetylcholine in the postoperative treatment of these cases is to be strongly condemned. Occasionally their use produces the dramatic relief of intestinal distension, but these successes are far outnumbered by the majority of cases which are made worse by such treatment. It should be borne in mind that the cause of the trouble is a paresis of the intestinal muscle which will resume its function when it has recovered its tone. This recovery is best facilitated by resting the gut as much as possible. It is for this reason that fluids by mouth are restricted or prohibited. Morphine is very valuable in these cases and should be given in small doses at regular intervals—e.g., gr. ⅛ four-hourly. If the case progresses satisfactorily, the abdominal distension gradually disappears and the bowels are naturally moved about the fourth day. After this the restriction on fluids by mouth may be withdrawn and treatment carried out along ordinary lines.

PARALYTIC ILEUS

There are many causes of paralytic ileus, but, so far as the surgeon is concerned, it most often complicates cases of peritonitis and of intestinal obstruction. It produces a painless progressive distension of the abdomen, which in the later stages is associated with vomiting and is apt to bring to a fatal ending what appeared to be a successful operation. It leads to a progressive circulatory failure along the lines outlined under mechanical obstruction. Its development can often be prevented by adopting the measures already described. Once it has developed, by far the most satisfactory method of treatment is one which has been described by American writers as "intestinal decompression." The principle of the method is the adoption of continuous mild suction through an indwelling catheter in the stomach or duodenum. A Ryle's or similar tube is passed through the nose or mouth and attached to an apparatus which provides a continuous slight suction, or aspiration with a syringe may be applied at short intervals. It has been shown that the intestinal tract can be drained as far as the ileo cæcal valve by such means. The patient obtains prompt relief from vomiting and from the discomfort due to abdominal distension It is preferable to allow fluids by mouth as soon as the apparatus is functioning, for this measure keeps the mouth fresh and gives much comfort to the patient. No harm is done, for the fluid is promptly siphoned back through the indwelling tube Careful note should always be kept of the volume of fluid given by mouth and of that removed by the tube In the early stages of treatment more fluid is removed than swallowed If the reverse happens, the stomach-tube is partially blocked or kinked. The fluid removed at first is usually brown foul-smelling contents of the small gut Later this changes to clear bile-stained fluid, and finally, as the intestine recovers its function, it is found that less fluid is removed by the stomach-tube than is taken by mouth Morphine is given in doses of gr. ⅛ four to six times daily. Fluid is supplied by a continuous intravenous drip in amounts of about 4–5 pints daily. Greater amounts should not be given, because of the danger of setting up œdema of the lungs and pneumonia. The condition is usually found to be resolving about the third or fourth day after treatment is begun. It is customary for the bowels to act naturally about the fourth day, if not, a glycerin enema is given. No purgatives or drugs such as pituitrin, eserine, or acetylcholine are to be given during the above treatment, for their use has been proved to aggravate the intestinal paresis.

The results of this treatment are extremely good. I have given up enterostomy completely since I began to use this method. In the past few years I have seen this treatment carried out in many cases of ileus In those cases which were not due to a peritonitis—they now mount up to about 30—there have been two deaths: one from pulmonary embolism and one from the results of the ileus In this latter case treatment was, in my opinion, instituted too late. The results in cases due to peritonitis are very encouraging but naturally not so satisfactory. The method of intestinal decompression relieves the abdominal distension and gives the patient a better chance to localise the peritoneal infection. But these cases have a way of slipping through one's fingers I can recollect three patients with ileus following appendicitis with general peritonitis who recovered from both the ileus and the peritonitis only to die from bronchopneumonia Such disappointments, however, do not detract from the value of the treatment.

CONCLUSIONS

Treatment of acute intestinal obstruction along the lines outlined is applicable chiefly to those cases in which there has been some delay in instituting treatment. For the very late case it is doubtful whether much good can be done. In these cases it appears that irreversible circulatory changes have taken place. There is a general increase in capillary permeability, and fluid injected intravenously rapidly passes out of circulation, carrying plasma proteins with it. They are usually described as inoperable, and sometimes a gallant attempt is made under local

anæsthesia to relieve the distension A good case can be made out for treating them by intestinal decompression and subcutaneous saline and making no effort to relieve the obstruction until the patient has obviously survived the systemic effects of the obstruction

The treatment outlined above has been based on an understanding of the general and local effects which follow the onset of acute intestinal obstruction I have no doubt that improved results will follow the general adoption of such measures, but any success which may follow must not be allowed to obscure the fundamental point in the treatment No understanding, however thorough, of the physiopathology of this condition will compensate for undue delay in treatment Early diagnosis and treatment must always remain the aim of the surgeon in dealing with acute intestinal obstruction

THE MECHANISM OF DIABETES MELLITUS *

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II—THE CONTROL OF THE BLOOD-SUGAR LEVEL

In the different examples of variation in the blood sugar level which have been considered it has been possible to trace the workings of an underlying purpose that the head of pressure of sugar in the blood, in the circumstances existing at any particular time, is adjusted to maintain the adequate utilisation of sugar by the tissues The mechanism by which these adjustments in the head of pressure of blood sugar are brought about must now be discussed, but, before doing so, it is necessary to consider the effect of two factors absorption of sugar from the intestines, and removal of the blood sugar by the extrahepatic tissues, which do not appear to be directly concerned in this purposive adjustment

ABSORPTION OF CARBOHYDRATE FROM THE INTESTINE

It has been shown by Cori [24 25] and by Verzár [124] that absorption of glucose from the gut is an active and not a purely physical process When a solution of glucose enters the gut, absorption begins at a maximal rate and proceeds at this rate, irrespective of either the amount or the concentration of the glucose present, until all the glucose is absorbed These findings agree with the observation that the blood sugar tolerance curve of the healthy human subject is practically uninfluenced by increasing the dose of oral glucose above a certain minimal dose and are in accord with the constancy of the blood-sugar curve under standard conditions In fig 5 are shown two blood sugar tolerance curves after ingestion of a standard dose of glucose, which were obtained from a healthy but very nervous subject On the first occasion half an hour elapsed after the glucose was taken before any rise of blood sugar was detected. On the second occasion, after he had become accustomed to the test, the blood sugar rose immediately The area of each sugar tolerance curve after it began to rise is the same This experiment suggests that on the first occasion passage of glucose from the stomach to the intestines was delayed, but, when the sugar entered the intestines, absorption proceeded at the normal rate It is possible that absorption from the intestines proceeds on an "all or none" principle The tacitly accepted view that hyperglycæmia following ingestion of sugar is accounted for by the excess of absorbed sugar entering the blood has been questioned by Heténya. [33 36] Struck by the fact that after the ingestion of glucose the rise of blood sugar could often be detected within two minutes, he suggested that alimentary hyperglycæmia was largely due to reflex liberation of sugar from the liver Unfortunately no sure proof of this attractive hypothesis has been brought forward, but the hypothesis would certainly explain the purposive variations in the glucose-tolerance curve

In certain conditions, such as sprue and cœliac disease, a low blood sugar tolerance curve is obtained Fairley [39] and Ross [115] have recently shown that the intravenous blood sugar tolerance curve in such diseases is unusually high, and they have suggested that the characteristically low oral tolerance curve is produced by defective absorption If Heténya's hypothesis proves to be correct, it may well be that the low curves in sprue and cœliac disease are due to diminution in the amount of glycogen in the liver, in which case the hyperglycæmia after injection of adrenaline should be slight

In view of the constancy of glucose absorption from the gut and the constancy of the blood sugar tolerance curve in each of several standard sets of conditions (table I in Lect I) it appears that the factor of intestinal absorption plays little part in determining the blood sugar curve of persons without intestinal disease

REMOVAL OF SUGAR FROM THE BLOOD

The outflow of sugar from the blood may be due either to its escape into the urine or to its removal by the tissues It is commonly believed that, when the blood sugar level exceeds the renal threshold, the sugar which escapes into the urine materially reduces the blood sugar level The evidence presented in Lect I shows that, in ordinary circumstances, this *is not so* When, however, the loss of sugar in the urine is rapid and excessive, as is seen after poisoning with phloridzin, the blood-sugar level may fall, but only after the liver has made extreme efforts to conserve it at its normal level I believe that in all other conditions, save possibly diabetic coma, the blood sugar level is uninfluenced by

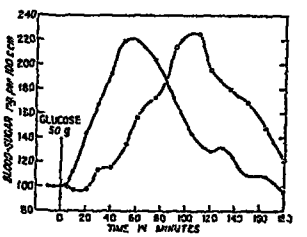

FIG 5—Two blood-sugar tolerance curves obtained from the same healthy subject when he was taking the same low-carbohydrate diet In one experiment the subject was nervous and the rise of blood sugar after ingestion of the glucose was delayed (circles), in the other experiment (disks) the rise was immediate Both sugar tolerance curves are nevertheless of the same size

* The Goulstonian lectures for 1939 delivered before the Royal College of Physicians of London on March 2 7, and 9 Lect I appeared in our last issue and the second part of Lect II and Lect III together with the references, will appear in later issues

glycosuria. In diabetic coma the demands on the liver for sugar may be so excessive that they can be met, if at all, only with difficulty. In these circumstances the augmentation of such demands by wastage of sugar in the urine may cause a demand on the liver for more sugar to which it cannot respond, with the result that the hyperglycæmia is not fully maintained.

It is also doubtful whether excessive utilisation of sugar from the blood by the peripheral tissues ever results in a fall of blood-sugar, for it is improbable that the rate of this utilisation ever exceeds the capacity of the liver to supply equivalent amounts of sugar to the blood In Graves's disease the total metabolism is increased, and, the proportions of the different foods oxidised remaining normal,[35] the peripheral utilisation of sugar must presumably be increased. Yet spontaneous hypoglycæmia does not occur, nor does the blood-sugar curve fall more rapidly. On the other hand, in diabetics who develop thyrotoxicosis this complication is accompanied not by a fall but by an elevation of the general level of hyperglycæmia, and with cure of the thyrotoxicosis this hyperglycæmia diminishes. When the peripheral utilisation of sugar is reduced or abolished in animals by poisoning with such substances as hydrocyanic acid[107] or iodo-acetic acid[76] or by lack of oxygen,[88] the blood-sugar rises. This, of course, may be due to the direct effect of such poison or of anoxæmia on the liver, but it may also be due to the reduction in ability of the tissues to oxidise carbohydrate, causing a condition of carbohydrate starvation of the tissues, in an effort to remedy which the liver pours out an excess of sugar into the blood. Reference can here be made to the conception of tissue storage of glucose developed by Soulá.[127] According to this conception, when an excess of sugar enters the blood-stream much of this diffuses into the peripheral tissues and then, as the blood-sugar falls, slowly returns to the blood. In conjunction with McNair Scott[70] I have obtained results compatible with the existence of a peripheral source of blood-glucose.

It is thus doubtful whether either the rate of absorption of sugar from the intestine or the rate of removal of sugar from the blood by the extrahepatic tissues plays a part in the adjustment of the blood-sugar level They appear rather as factors which, by influencing the movement of sugar into or out of the blood, call into play the active mechanisms which adjust the head of pressure of blood-sugar to the appropriate level.

MECHANISMS INVOLVED IN THE ADJUSTMENT OF THE BLOOD-SUGAR LEVEL

At the centre of the mechanism adjusting the head of pressure of blood-sugar stands the liver. It is the effector organ directly producing the compensatory variations in the blood-sugar level In hepatectomised animals the blood-sugar falls steadily until death results from hypoglycæmia, thus showing that in the fasting organisms the liver is constantly secreting sugar into the blood and so maintaining the blood-sugar at the appropriate level[90 91] In the liver carbohydrate is stored as glycogen, and this constitutes the source of blood-glucose. Liver-glycogen can be formed from materials other than glucose such as proteins, hexoses other than glucose, glycerol, and lactic acid. That the transformation of these substances to glucose in the intact animal is brought about by the liver is indicated by the fact that in the hepatectomised animal none of them can relieve hypoglycæmia.[91] It is still a controversial question whether liver-glycogen can be formed from fatty acids, but evidence is steadily accumulating in favour of this view.[122 139] The liver, therefore, not only secretes but manufactures glucose, and the rate at which these reactions of the liver proceed is largely governed by the various endocrine glands, the function of which may now briefly be reviewed.

PITUITARY GLAND

The association between disease of the pituitary gland and abnormal carbohydrate metabolism has been known since Pierre Marie recorded the frequent occurrence of glycosuria in acromegalics, and the more recent recognition by Cushing[29] of the frequency of glycosuria in cases of pituitary basophilism has strengthened the clinical evidence for this association The demonstration by Burn[17] that the extract of the posterior lobe of the gland, pituitrin, raised the blood sugar directed attention to the posterior lobe as the source of the disturbance of carbohydrate metabolism in these diseases, but recently the brilliant work of Houssay and his school has pointed attention to the anterior lobe. The large volume of work on the relationship of the anterior-pituitary gland to carbohydrate metabolism has been reviewed by Houssay[72 73] and by Russell,[117] and reference can be made to their articles for the extensive bibliography on this subject

The problem of the influence of the anterior-pituitary gland on the activities of the liver can best be approached by considering the effect of removing this gland on a condition with which we are already familiar. We have seen that, when a normal fasting animal is poisoned with phloridzin, the head of pressure of blood-sugar falls because of the drain of the excessive glycosuria, and in an attempt to maintain the head of blood-sugar pressure the liver pours sugar into the blood rapidly. This sugar is derived in the first place from the carbohydrate stored in the liver as glycogen and later, when this store proves insufficient, from sugar manufactured in the liver out of body protein and possibly out of fat The excessive breakdown of body protein is revealed by an increased excretion of nitrogenous substances in the urine; the excessive combustion of fat by the excretion of ketone bodies. When, however, a hypophysectomised animal is poisoned with phloridzin, the findings are quantitatively different in two important respects: the excretion of urinary nitrogen is little more than normal,[14] and ketonuria is either absent or minimal.[113] This indicates that in the hypophysectomised animal poisoned with phloridzin there is little acceleration in the rate of destruction of protein and of fat, and we can infer from this finding that after hypophysectomy the ability of the liver to form sugar from non-carbohydrate materials is impaired This effect of removing the anterior-pituitary gland is further illustrated by the influence of hypophysectomy on pancreatic diabetes. Soon after removing the pancreas from a dog the blood-sugar rises and glycosuria develops Later the urinary excretion of nitrogen rises and ketonuria develops, indicating that the rate at which protein and fat are being broken down is accelerated.[72] If now the anterior-pituitary gland is removed, the excretion of urinary nitrogen and the ketonuria diminish, and at the same time the blood-sugar level falls and glycosuria decreases[72 73] Hypophysectomy has impaired the ability of the liver to form sugar from non-carbohydrate materials and to maintain the blood-sugar at the high level characteristic of diabetes.

In these two conditions, phloridzin poisoning and pancreatectomy, the liver is secreting sugar into the

blood at an excessive rate, and the question arises as to the effect of hypophysectomy on the liver when it is secreting sugar at normal rates What part does the anterior pituitary gland play in determining the supply of sugar to the blood in normal circumstances? After removal of the hypophysis from a normal animal there is a pronounced tendency for the blood-sugar level to fall on fasting, and not uncommonly such animals die from hypoglycæmia [22 26] Cope has shown that this fall of blood sugar does not take place before the glycogen content of the liver is greatly reduced, and that after death glycogen is present in the liver only in traces [22] This abnormal reduction of liver glycogen by fasting can be attributed to the impaired ability of the liver to manufacture sugar from non carbohydrate sources and thus replenish its store of glycogen The hypoglycæmia exhibited by the fasting hypophysectomised animal demonstrates that in the absence of the pituitary gland the liver cannot maintain the normal supply of sugar to the blood, and in this connexion the evidence that after removal of the anterior pituitary gland the glycogen in the liver is resistant to mobilisation as sugar is important [23] Further proof is, however, required on this point It appears, therefore, that removal of the anterior pituitary gland impairs the hepatic mechanism concerned with the maintenance of the appropriate head of pressure of sugar in the blood and reduces the ability of the liver to manufacture sugar from non carbohydrate materials

These functions of the liver can be restored to full activity in hypophysectomised animals, and stimulated to excessive activity in normal animals, by injection of extracts of the anterior pituitary gland When such an extract is injected into the hypophysectomised animal, the tendency for the blood-sugar to fall spontaneously disappears When the extract is injected into a hypophysectomised depancreatised dog, the amelioration of the diabetes, consequent upon hypophysectomy, is removed Hyperglycæmia and glycosuria become severe, the excretion of urinary nitrogen rises, and ketonuria develops [72 73 117] Formation of sugar from non carbohydrate sources has again been raised to the excessive rate prevailing in the ordinary depancreatised dog Similar effects are produced even in the normal animal After injection of the extract hyperglycæmia, glycosuria, and ketonuria appear, but in the normal animal, for some reason that is not yet understood, the excretion of urinary nitrogen does not increase For the manifestation of these effects the liver is essential [73] It has been suggested by Cope and Marks [23] that anterior pituitary extracts also facilitate the mobilisation of liver glycogen Their suggestion was based on the observation that the hyperglycæmia following subcutaneous injection of adrenaline was increased in animals treated with these extracts This suggestion has recently been criticised because it has since been found that the hyperglycæmia after intravenous injection of adrenaline is not increased [110 141] But the facts that after injection of the extracts slight external stimuli readily produce hyperglycæmia,[23 142] and that in partially hepatectomised animals treated with these extracts a fall in blood sugar leads to an excessive outflow of sugar from the liver,[69] both point to the increased facility with which the liver supplies sugar to the blood in these circumstances Whatever the decision on this point, however, it appears that extracts of the anterior pituitary gland accelerate the formation of sugar by the liver from non carbohydrate sources and facilitate the hepatic mechanism concerned with the maintenance of the blood sugar level (table III) It is thus clear that the anterior pituitary gland is of the utmost importance to the liver for its functions of manufacturing glucose from non carbohydrate sources and of supplying sugar to the blood at rates sufficient to maintain the appropriate head of blood sugar pressure

TABLE III—EFFECT OF ANTERIOR PITUITARY GLAND ON CARBOHYDRATE METABOLISM

Anterior-pituitary gland

Liver Facilitates	Peripheral Tissues Retards
(1) Formation of sugar from non-carbohydrate sources	(1) Insulin action on blood-sugar
(2) Breakdown of glycogen to blood sugar	(2) Muscle glycogen formation
	(3) Oxidation

In the foregoing considerations attention has been confined to the effects of the anterior-pituitary gland on the liver—i e, to the effects upon the production of sugar But the anterior-pituitary gland also influences the disposal of the blood-sugar, and the most striking example of this is its effect on insulin action [72 73 117] If insulin is injected into an animal which has previously been treated with extracts of the anterior-pituitary gland, it does not depress the blood sugar [25 139 141] This antagonisation of insulin action might be due to one of two causes either the extracts directly inhibit the action of insulin in accelerating the rate at which the peripheral tissues remove sugar from the blood, or they merely mask insulin action by promoting an excessive outpouring of sugar from the liver The former possibility has been proved to be correct Marks,[25] in 1936, showed that the effect of insulin in promoting formation of muscle glycogen in decapitated eviscerated preparations was greatly reduced if the animals had previously been treated with anterior-pituitary extracts, and later Himsworth and Scott [69] showed that these extracts also abolished the action of insulin in accelerating the fall of blood sugar in hepatectomised animals Factors are therefore present in the anterior-pituitary gland which reduce the action of insulin in the peripheral tissues

We have previously seen that the reduction in insulin sensitivity which follows restriction of dietary carbohydrate is a phenomenon localised in the periphery, and the question now arises as to whether the variations in sugar tolerance and in insulin sensitivity produced by dietary change are referable to changes in the activity of the anterior pituitary gland McNair Scott and I [69] investigated the effect of restriction of dietary carbohydrate on hypophysectomised rabbits and found that the normal effect of this measure in impairing sugar tolerance and insulin sensitivity was greatly reduced, if not entirely lacking We found further that injection of an extract of the anterior-pituitary gland into these animals resulted in an impairment of sugar tolerance and of sensitivity to insulin similar to that which develops in normal animals after starvation or restriction of dietary carbohydrate It therefore appears possible that the changes in insulin sensitivity and the correlated changes in sugar tolerance which result from dietary variations can be explained in part, if not entirely, by variations in the rate of secretion of a factor from the anterior pituitary gland

The association of impaired insulin sensitivity and diminution in the ability to oxidise glucose has been

emphasised previously, and it is therefore of interest that evidence has been produced indicating that the anterior-pituitary gland has an influence on the oxidation of glucose [72 73 117] When pituitary extracts are injected into normal animals, the respiratory metabolism becomes such as is usually taken to denote minimal combustion of carbohydrate.[43 101 116] In the depancreatised dog the respiratory metabolism is of this type, and administration of glucose to these animals does not produce the usual increase in respiratory quotient and oxygen consumption. If, however, the hypophysis is removed from a depancreatised dog, the respiratory metabolism now suggests that the ability to utilise carbohydrate has been partially restored [13 74 120] The prolonged survival of hypophysectomised depancreatised dogs, in comparison with ordinary depancreatised dogs, is perhaps to be attributed as much to this restoration of their ability to use carbohydrate as to the fact that the production of ketones in these animals is insufficient to cause fatal ketosis.

One may well ask at this stage what function the anterior-pituitary gland subserves in the economy of the normal animal. The gland appears to be concerned with the reaction to deprivation of carbohydrate It seems that, when carbohydrate is restricted, the anterior-pituitary gland is stimulated to an increased secretion of its factors. By retarding oxidation of sugar and insulin action in the peripheral tissues it economises utilisation of the blood-sugar, and by facilitating increased production of sugar from non-carbohydrate sources in the liver it augments the amount available for maintaining the blood-sugar level (table III). When the restriction of utilisable carbohydrate is more severe than in simple starvation, as when through lack of insulin the body loses to a great degree its ability to use carbohydrate, these same reactions are called into intense activity, with the result that their manifestations dominate the clinical picture.

ADRENAL GLANDS

It is well established that the secretion of the adrenal medulla, adrenaline, plays a definite part in carbohydrate metabolism, and considerable evidence has recently been obtained which suggests that the adrenal cortex plays an even more important part. On injection of adrenaline in normal animals hyperglycæmia results,[15] and the degree of hyperglycæmia is roughly proportional to the dose.[36] This hyperglycæmia is associated with a depletion of liver-glycogen, and in hepatectomised animals adrenaline does not raise the blood-sugar.[91] From these facts it is concluded that adrenaline produces hyperglycæmia by mobilising liver-glycogen. When the blood-sugar is depressed by insulin, adrenaline is liberated,[19] and after hypoglycæmia the amount of glycogen in the liver is reduced [24] It therefore appears that in the emergency of hypoglycæmia adrenaline plays an important part in the return of the blood-sugar to normal levels Besides its central action in the liver adrenaline influences the abstraction of sugar from the blood by the peripheral tissues Cori [24] is of the opinion that adrenaline diminishes the peripheral utilisation of sugar, but by direct experiment Soskin et al.[124] have shown that the peripheral utilisation of sugar is not decreased, and recently evidence has been obtained which indicates that adrenaline increases the amount of sugar removed in the periphery.[70]

The rôle of the adrenal cortex in carbohydrate metabolism is still controversial. In the crises of Addison's disease and in the terminal days of survival of adrenalectomised animals hypoglycæmia develops [77 110] and the glycogen stored in liver and muscles falls to low levels [16] There appears to be some relationship between the adrenal cortex and the hypophysis. Viale [135] reported that pancreatic diabetes in the dog was ameliorated after adrenal ectomy, and Houssay and Biasotti [75] obtained the same results in toads Gondard [49] and Lewis and Turcatti [84] could not confirm this Using depancreatised cats, however, Long and Lukens [86] have consistently found that after removal of the adrenal glands the survival time of these animals is prolonged almost to the same extent as after hypophysectomy A similar disagreement exists about the effect of extracts of the anterior-pituitary gland on adrenal ectomised animals Houssay [73] and his colleagues state that adrenalectomy does not reduce the hyperglycæmia previously produced by such extracts in dogs, and that implantation of the pituitary gland into adrenalectomised toads still causes hyperglycæmia. McNair Scott and I have found that the glycotropic factor of the hypophysis is still active in adrenalectomised rabbits [69] On the other hand, Long [85] finds that in adrenalectomised and partially depancreatised rats extracts of the anterior-pituitary gland are without effect It is possible that these discrepancies may be explained as due to the differing reactions of different species of animals or possibly by differences in the extracts used.

THYROID GLAND

Glycosuria occasionally develops in thyrotoxicosis, and in such cases sugar tolerance is also impaired When the basal metabolic rate is reduced, either by administration of iodine or by thyroidectomy, the glycosuria diminishes or disappears and the sugar tolerance returns towards normal. Griffiths [52] reports that in cases of Graves's disease a high-grade insulin insensitivity, as judged by the insulin-glucose test, may be found, and that such insensitivity is diminished by thyroidectomy. After administration of large amounts of thyroid gland to rabbits the liver-glycogen practically disappears [28] and coincidentally the metabolic rate and the urinary excretion of nitrogen rise Usually the sugar tolerance in such animals is little impaired.[97] After thyroidectomy the return of the blood-sugar from hypoglycæmic levels to normal is said to be slow. Although it is possible that the secretion of the thyroid gland acts directly on the liver, such an assumption is not necessary. An alternative explanation of the events after administration of thyroid extract would be as follows. Thyroid extract raises the metabolic rate of the tissues and thus increases their demand for sugar The liver attempts to meet this demand first by liberation of glucose from glycogen and secondarily by increasing the rate of new formation of sugar from protein Such metabolic activity on the part of the liver can be produced by injection of extracts of the anterior-pituitary gland If the increased demand of the tissues for sugar in thyrotoxicosis causes the anterior-pituitary gland to secrete in excess the factor concerned in carbohydrate metabolism, the increased activity of the liver and the associated insulin insensitivity would be explained In this connexion the relative frequency with which diabetes develops in persons who have, or who have had, thyrotoxicosis [78] may be remembered when the production of permanent diabetes mellitus by administration of extracts of the anterior-pituitary gland is discussed

(To be continued)

PARENTERAL THERAPY WITH M. & B. 693 SOLUBLE

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THE use of M & B 693 has materially reduced the case-mortality in pneumonia during the fifteen months since its introduction (Evans and Gaisford 1938, Anderson and Dowdeswell 1939, Agramat, Dreosti, and Ordman 1939, Flippin, Lockwood, Pepper, and Schwartz 1939, Graham, Warner, Dauphinee, and Dickson 1939, Meakins and Hanson 1939) This drug is still proving to be one of the least toxic of the sulphanilamide group, and no serious complications have followed its administration in more than a thousand cases at Dudley Road Hospital

The chief drawback is its liability to cause vomiting in some cases, though this seldom happens in infants and young children, in adults it may be a prominent feature The cause of the vomiting is not yet clearly understood, it may be of central origin or due to gastritis That gastritis plays some part in the process is suggested by the absence of vomiting in children, who are less subject than adults to gastritis Although the vomiting can be minimised by varying the mode of administration and dosage, so that it is seldom that insufficient drug is retained to produce the desired concentration in the blood, occasionally patients are encountered, especially the very ill ones, who are unable to swallow the tablets even when finely crushed and suspended This may be due to the general condition—e g, delirium—or to the state of the mouth In such cases parenteral administration becomes imperative In overwhelming or mass infections it may also be desirable to supplement the oral route with parenteral therapy It is particularly valuable in treating pneumococcal meningitis

From the earliest days of research on the anti pneumococcal properties of 2 sulphanilyl amino pyridine attention has been devoted to the possibility of producing a soluble form of the drug All substances examined have been rejected for a variety of reasons—e g, toxicity or lower therapeutic activity —with the possible exception of the sodium salt This, however, while possessing antipneumococcal properties had the serious drawback of being highly alkaline To overcome this difficulty an oily suspension (0 5 g in 2 5 c cm) of M & B 693 was prepared and widely used but did not prove altogether successful, because of the limited number of injections possible and the low concentration of the drug obtainable in the blood Owing to this unsatisfactory outcome attention was redirected to the possible clinical use of the sodium salt, which was first tried in a 25 per cent solution given intramuscularly (0 5 g in 2 c cm solvent) and subsequently in a concentration of 33⅓ per cent (1 g in 3 c cm) In the latter form it has been administered to many patients, and this communication presents our findings to date For the most part injections of 3 c cm have been given every three or four hours intramuscularly, but in a few cases the intravenous route has been employed, the solution being made up to 10 c cm with distilled water, however, the latter method led to vomiting and was followed by rigors in some cases The substitution of normal saline for distilled water as a diluent prevented the rigors, but, in view of the fact that intramuscular injection did not cause any such unpleasantness and was rarely followed by vomiting, it appears to be the method of choice for parenteral administration Despite the high alkalinity no untoward effects have followed the injections, and these have not been unduly painful Absorption and excretion are both rapid The effect on children has also been investigated, the doses employed varying from 0 15 to 1 0 g according to age, no ill effects being observed

Various pneumococcal infections have been treated successfully, but no attempt has been made to present the results in statistical form, since it was the therapeutic method that was being studied Specimen protocols are attached

INVESTIGATIONS UNDERTAKEN

At intervals after injection specimens of blood were taken and the concentration of M & B 693 was estimated Urine was similarly examined and, in four cases, vomitus and, in two cases, breast milk The number of investigations on each patient was determined by the degree of illness and by the hour of the day (or night), but samples of blood were taken to enable graphs to be plotted showing the concentration of the drug in the blood at approximately 15 minute intervals throughout the 4 hour periods Thus, one patient had samples withdrawn at ½, 1,

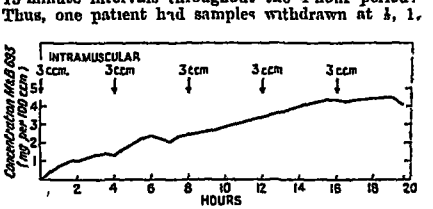

FIG 1—Concentration of M & B 693 in blood of patients given 1 g of M & B 693 soluble intramuscularly four hourly

1½, 2, 2½, 3, 3½, and 4 hours, another comparable one at ¼, ¾, 1¼, 1¾, 2¼, and so on, another at 5, 35, 65 minutes, and so on, for it was impracticable to collect samples of blood very frequently from the same patient A curve showing the average concentration of M. & B 693 in the blood of patients given intramuscular injections of 1 g of the sodium salt every four hours is shown in fig 1 It can be seen that an average concentration of 4 mg per 100 c cm is obtained after the fourth injection

Similarly, fig 2 shows the average concentration of M & B 693 in the blood after intravenous injection of 1 g every four hours By this method a concentration of approximately 4 mg per 100 c cm is obtained within half an hour The level then falls rapidly but rises again with subsequent injections

In most cases after initial doses of the sodium salt parenterally, 1 g of M & B 693 was given orally four hourly, and curves were obtained showing the maintenance of blood level by this means In fig 3 is shown the typical curve for a child (case 4) who received one intramuscular injection of 0 15 g and

four of 0 3 g. of the sodium salt at four-hourly intervals A concentration of about 4 mg per 100 c cm was reached after the fourth injection. Fig 4 is a curve showing the maintenance of the blood level by oral administration after several intramuscular injections had been given.

The blood levels varied within such wide limits in individual cases that it is impossible to present more

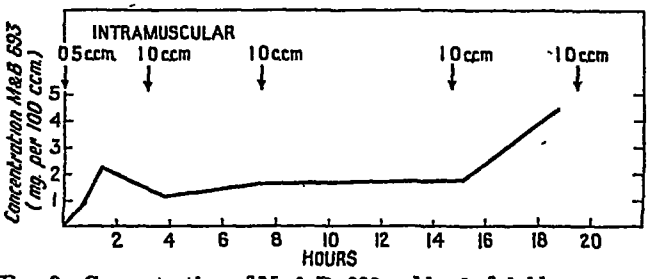

FIG 3—Concentration of M. & B 693 in blood of child given one intramuscular injection of 0·15 g M. & B. 693 soluble and four of 0 3 g. at four-hourly intervals

than average curves, but the investigations carried out show that the administration of M. & B. 693 soluble is a perfectly justifiable procedure

COMPLICATIONS

Three children developed small punched-out oval ulcers about ¼ in deep over the site of an injection, which had been given subcutaneously. Culture of the pus showed *Staphylococcus aureus* in one, and the other two were sterile That such a complication might occur is not surprising in view of the high pH and from animal experiments, but it has only happened in injections given subcutaneously in error, and these were in young children in whom intramuscular injection was difficult. It would appear, however, that the risk is slight, provided that the injections are given sufficiently deeply into the gluteal muscles, and that no drug is allowed to contaminate the needle-track. Further, it will seldom be found necessary to give more than four parenteral doses before oral therapy is initiated or resumed, owing to clinical improvement in the patient. Actually over 200 injections have been given without mishap

CLINICAL DETAILS

CASE 1.—A boy, aged 8, with right lower lobar pneumonia, admitted on the second day of illness,

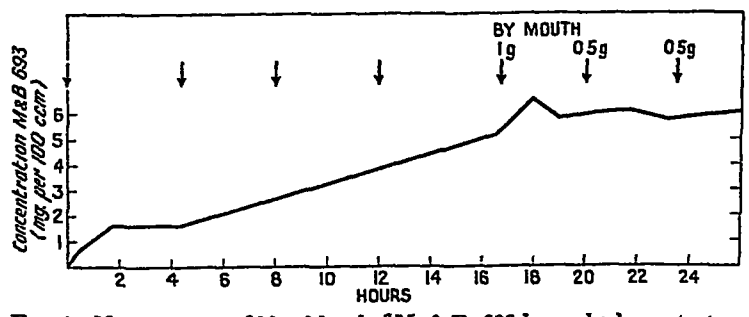

FIG 4—Maintenance of blood level of M. & B. 693 by oral administration after four intramuscular injections

received five intramuscular injections of 0 3 g. of M. &. B. 693 soluble at four-hourly intervals. One hour after the fifth dose the concentration of the drug in the blood was 4·8 mg. per 100 c.cm. The temperature fell in twenty-four hours after starting the treatment. Cured.

CASE 2.—A male infant, aged 11 months, admitted on the third day of bronchopneumonia, received four intramuscular injections of 0 15 g at four-hourly intervals. The temperature fell in twenty-four hours. Cured.

CASE 3.—A male infant, aged 16 months, admitted with extensive bronchopneumonia on the third day of illness, received five intramuscular injections of 1 c.cm. of the 25 per cent solution of the sodium salt at four-hourly intervals The temperature fell in twenty-four hours. Cured

CASE 4.—A boy, aged 6, admitted on the fourth day of a right lower lobar pneumonia, was given 0 15 g. of the sodium salt immediately and 0 3 g. every four hours for four injections by the intramuscular route. An hour and a half after the first injection the concentration of the drug was 2 2 mg. per 100 c.cm. of blood; at the time of the last injection it was 4 4 mg. per 100 c cm. The temperature fell in thirty-six hours. Cured.

CASE 5.—A youth, aged 16, with left lower lobar pneumonia, admitted on the fourth day of illness, received two injections of 1 g intravenously followed by 1 g. every four hours by mouth for five doses. A concentration in the blood of 1 8 mg. per 100 c cm. was reached an hour after the first injection. The temperature fell in fifty-six hours. Cured.

CASE 6.—A man, aged 25, with left lower lobar pneumonia, pneumococcus types XII and XIV being isolated, admitted on the fourth day of illness, was given five intramuscular injections of 1 g. at four-hourly intervals. Cured.

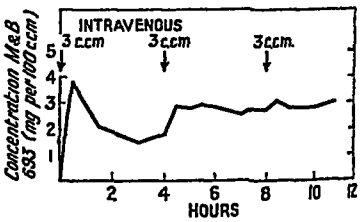

FIG 2—Concentration of M. & B. 693 in blood of patients given 1 g. of M. & B. 693 soluble intravenously four-hourly.

CASE 7.—A man, aged 29, admitted on the third day of a right lower lobar pneumonia due to pneumococcus type I, received four intramuscular injections of 1 g. of M. & B. 693 soluble at four-hourly intervals. Cured.

CASE 8.—A woman, aged 30, with left lower lobar pneumonia, admitted on the fifth day of illness. Pneumococcus type VII was isolated. Two intravenous injections of 1 g. were given at four hours' interval, followed by 1 g of M. & B. 693 orally every four hours for five doses. The patient was lactating, and two samples of breast-milk were examined for their content of M. & B. 693. Immediately after the second intravenous injection of the sodium salt the left and right breast-milk contained 2 5 mg. of the drug per 100 c cm. The concentration in the milk from the left breast rose to 3 mg. per 100 c cm. before the oral administration of the drug was started. An hour and a half after the fourth oral administration the concentration of the drug in the left breast-milk was 2 0 mg and in the right breast-milk 2 5 mg. per 100 c cm. The blood level half an hour after the second intravenous administration was 4 3 mg per 100 c cm. but reached 6 0 mg per 100 c cm. twenty-five hours after the last oral dose. The temperature fell within twenty-four hours after the institution of treatment. Cured.

CASE 9.—A woman, aged 76, very ill on admission on the third day of a right middle lobar pneumonia, was given 1 g. of M. & B. 693 soluble intramuscularly every four hours for seven injections. A concentration of 5 3 mg per 100 c.cm. in the blood was attained

one and three-quarter hours after the fourth injection The temperature fell in twenty-four hours Cured

CASE 10 —A woman aged 35 admitted extremely ill, on the sixth day of illness with both lower lobes consolidated, received seven intramuscular injections of 1 g at four-hourly intervals, followed by 1 g by mouth every four hours The temperature remained irregular for ten days and then fell Cured

CASE 11 —A woman aged 28, admitted on the fifth day of a right lower lobar pneumonia due to pneumococcus type III was given M & B 693 2 g by mouth every four hours for four doses An hour after the last dose the concentration of the drug in the blood was 3 4 mg per 100 c cm An intramuscular injection of 1 g of the sodium salt was then given, followed by another injection of the same amount after four hours, with two further injections at six-hourly intervals The concentration of the drug in the blood one and three quarter hours after the first injection was 7 3 mg per 100 c cm The patient vomited five hours after the second intramuscular injection The concentration of M & B 693 in the vomitus was 90 mg per 100 c cm The temperature fell within forty-eight hours after the start of treatment Cured

CASE 12 —A youth aged 16, with left lower lobar pneumonia of indefinite onset due to pneumococcus type XXIV There was also a tuberculous cavity at the left apex and the sputum was positive for tubercle bacilli The patient received two intramuscular injections of 1 g at four hours' interval The temperature fell within forty-eight hours Cure of the pneumonia

CASE 13 —A woman, aged 46 admitted on the fourth day of a left lower lobar pneumonia, received two intravenous injections of 1 g at four hours' interval A blood concentration of 1 6 mg per 100 c cm was reached seventeen minutes after the first injection The temperature fell within twenty-four hours Cured

CASE 14 —A woman, aged 44 with broncho-pneumonia, admitted on the fourth day of illness, received seven injections of 1 g of the sodium salt intramuscularly at four-hourly intervals Three hours after the last injection a concentration of 5 9 mg of M & B 693 per 100 c cm was found in the blood Eight hours after the injection the level was 4 7 and twenty-one hours later 3 3 mg per 100 c cm The temperature fell within twenty-four hours. Cured

CASE 15 —A man, aged 35, admitted on the second day of bronchopneumonia, was given M & B. 693 soluble intramuscularly in doses of 1 g every four hours for four injections, followed by M & B 693 1 g and then 0 5 g every four hours by mouth At the start of the oral administration the concentration of M & B 693 in the blood was 5 1 mg per 100 c cm The temperature fell within twenty-four hours Cured

CASE 16 —A youth aged 16, admitted with "influenza" which had been present for four days, was given intramuscular injections of 1 g at four-hourly intervals About two to four hours after the third injection he vomited, and the M & B 693 content of the vomitus was very high—180 mg per 100 c cm The patient's temperature fell within twenty-four hours of the start of treatment Cured

CASE 17 —A very frail senile man, aged 71, with pneumonia affecting the right lower lobe, admitted in a grave toxic state on the third day of illness, was given four intramuscular injections of 1 g at four-hourly intervals He died after three days, though the temperature fell within twenty-four hours of admission No post-mortem examination was made

CASE 18 —A woman aged 56 with chronic bronchitis and emphysema admitted with an acute attack of bronchitis of four days' duration, received intramuscular injections of 1 g of M & B 693 soluble at four-hourly intervals for five doses, followed by 1 g of M & B 693 orally A concentration of 1 g of M & B 693 per 100 c cm in the blood 0 4 mg of M & B 693 per 100 c cm in the blood was reached two hours after the fifth injection The temperature fell within twenty four hours Cured

CASE 19 —A man, aged 35, with right upper lobar pneumonia, admitted on the third day of illness Pneumococcus type I was isolated Five intramuscular injections of 1 g of the sodium salt were given at four hourly intervals, followed by 1 g of M & B 693 by mouth The concentration of M & B 693 in the blood two hours after the first administration was 7 5 mg per 100 c cm and rose to 10 3 mg per 100 c cm two and a half hours after the last injection The temperature fell within twenty-four hours Cured

CASE 20 —A youth, aged 16, with acute rheumatic fever, received four injections of 1 g intravenously at four-hourly intervals The concentration of M & B 693 in the blood half an hour after the first injection was 11 0 mg per 100 c cm , but after another hour this had fallen to 2 1 mg per 100 c cm , rising to 3 6 mg per 100 c cm after the second injection The patient vomited about two and a half hours after the second injection, the concentration of M & B 693 in the vomitus being 4 6 mg per 100 c cm

CASE 21 —A female infant, aged 1 year, with migratory right upper lobar pneumonia, was given five intramuscular injections of 0 15 g at four-hourly intervals The temperature fell, but it rose again a few days later, when a fresh area of consolidation appeared This second rise in temperature was controlled by M & B 693 by mouth A concentration of 7 2 mg of M & B 693 per 100 c cm of blood was obtained one and a half hours after the third injection Cured.

CASE 22 —A man, aged 52, admitted on the seventh day of a mild bronchopneumonia, was given four intramuscular injections of 1 g at four-hourly intervals The temperature fell within twenty-four hours Cured

CASE 23 —A man, aged 38, with left lower lobar pneumonia due to pneumococcus type I, admitted on the fourth day of illness, received two intravenous injections of 1 g at four hours' interval A concentration of 9 6 mg per 100 c cm was obtained one and a half hours after the first injection The temperature fell within forty-eight hours A clear sterile effusion subsequently developed, but was spontaneously absorbed Cured

CASE 24 —A man, aged 71, admitted on the third day of a type I right lower lobar pneumonia, was given two intravenous injections of 0 5 g of M & B 693 soluble at four hours' interval, followed by 1 g of M & B 693 every four hours by mouth An hour after the last injection the blood level of M & B 693 was 1 2 mg per 100 c cm A rigor occurred an hour after the second injection, when the blood level was about 1 5 mg per 100 c cm This patient developed a type I empyema but subsequently recovered

CASE 25 —A woman, aged 50, with well marked bronchopneumonia of indefinite onset, who was very ill on admission Type IX pneumococci were isolated from the sputum The dosage of the sodium salt was 1 g intramuscularly every four hours three injections being given Cured

CASE 26 —A man, aged 61, admitted on the second day of "influenza," received two intramuscular injections of 1 g at four hours' interval The temperature fell within forty-eight hours Cured

CASE 27 —A man, aged 25, admitted on the fourth day of a left lower lobar pneumonia Pneumococcus type XII was isolated Intramuscular injections of 1 g of M & B 693 soluble were given four-hourly for five doses, followed by 1 g of M & B 693 every four hours by mouth A concentration of 3 5 mg per 100 c cm was reached after the administration of the last dose Four hours after the last injection the patient vomited The vomitus contained 2 1 mg of the drug per 100 c.cm The temperature fell after four days Cured

CASE 28 —A man aged 29, admitted on the third day of a right lower lobar pneumonia due to pneumococcus type I, received four intramuscular injections of 1 g at four-hourly intervals The temperature fell within twenty four hours Cured

CASE 29.—A male infant, aged 1 year, admitted, very ill, on the seventh day of meningitis due to *Hæmophilus influenzæ*, was given six intramuscular injections of 0 15 g. at four-hourly intervals A concentration of 5 mg. per 100 c.cm. of blood was reached one and a half hours after the third injection. Died. *Post-mortem examination*: the child was a mongoloid; bilateral submaxillary abscesses containing *Staphylococcus aureus* were found. There was some pulmonary collapse and pleurisy (*H. influenzæ* and pneumococcus type III) Cultures of material from the middle ears also showed *H. influenzæ* and pneumococcus type III. Pus from the meninges grew *H. influenzæ*.

CASE 30.—A male infant, aged 7 months, very *ill on admission with severe bronchopneumonia*, was first treated with M. & B. 693 by mouth, 0 25 g. every four hours for five days, followed by 0 25 g. thrice daily for twenty-one days. Six intramuscular injections of 0 15 g. were then given at four-hourly intervals. The blood level was 6 7 mg. per 100 c.cm. five and a half hours after the last dose; after a further five and a half hours it had fallen to 4 4 mg. per 100 c.cm, and twenty-nine and a half hours after the dose the level was 2 0 mg. per 100 c.cm. Cured.

CASE 31.—A girl, aged 4, very ill with bronchopneumonia and pertussis, was given eight intramuscular injections of 0 3 g. and one of 0·6 g. at four-hourly intervals. Two hours after a dose of 0 3 g. the concentration of M. & B. 693 in the blood was 3 6 mg. per 100 c.cm. Five and three-quarter hours after an intramuscular injection of 0 6 g. the blood level was 5 0 mg. per 100 c.cm. Died. At post-mortem examination both lungs were found to be solid all over, with confluent bronchopneumonia.

CASE 32.—A male infant, aged 7 months, very ill with bronchopneumonia and pertussis, received twelve intramuscular injections of 0·15 g. at six-hourly intervals. Four and a half hours after the last dose the blood level was 5·2 mg. per 100 c cm. Died. At post-mortem examination severe bronchopneumonia was found, affecting both lower lobes. The hilar glands were enlarged. Pneumococci were found in both middle ears.

CASE 33.—A girl, aged 6, very ill with bronchopneumonia and pertussis, was given five intramuscular injections of 0 6 g. at six-hourly intervals. One and a quarter hours after the last injection the blood level was 12 3 mg. per 100 c cm.; forty-seven and a half hours later it had fallen to 0 2 mg. per 100 c.cm. Died. No post-mortem examination was made.

In four of the cases (11, 16, 20, and 27), in which vomiting took place, the concentration of the drug in the vomitus was estimated The values found were 30 mg, 180 mg, 4 mg, and 2 4 mg. per 100 c.cm

CONCLUSIONS

The occasional need for a parenteral form of administration of M. & B 693 is undoubted, and the sodium salt in a 33⅓ per cent solution (1 g in 3 c cm.) is an adequate preparation. Clinically it is no more toxic than M & B 693, is not unduly painful after injection, is rapidly absorbed and excreted, and is less likely to cause vomiting than M & B 693 given orally

In our experience intramuscular is preferable to intravenous injection, being easier for general use and less liable to cause reaction and vomiting, and giving an equally satisfactory concentration in the blood. It is essential that the injection be given *intramuscularly* and not subcutaneously, or non-absorption and local necrosis may take place Although comparatively few patients have been treated so *far, the results of this preliminary clinical trial* appear to justify its use in selected cases, either where there is a mass infection or in which M. & B. 693 causes persistent vomiting It is not intended to replace the oral preparation. A satisfactory scheme is to give four to six injections of 3 c cm. at four-hourly intervals These may be followed by smaller doses of M & B. 693 orally—e g, 1 g four-hourly till the temperature falls. Such a system is less likely to cause continued vomiting in susceptible patients than the large initial dosage in general use at present The drug may safely be given to children and babies in appropriately reduced dosage

We are indebted to Dr. T. M. Anderson, deputy medical superintendent, for permission to publish these cases; to our colleagues for their collaboration; and to Dr. W. R. Thrower for his help throughout the investigation. We are also indebted to Miss G. Phillips for technical assistance in the biochemical estimations. We have great pleasure in acknowledging the courtesy of Messrs. May and Baker Ltd., who provided us with supplies of the sodium salt.

Since this paper was prepared we have seen the article by E. K. Marshall and P. H. Long (*J. Amer. med. Ass.* 112, 1671) in which they state that the intravenous is the only satisfactory method of giving the sodium salt. This is at variance with our conclusions. Further experience may show that both methods will have their place in therapeutics.

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PNEUMONIA COMPLICATING HÆMATEMESIS

TREATED WITH M & B SOLUBLE

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THIS note reports a difficult clinical problem solved by the administration of the soluble sodium salt of M. & B 693 ("Dagenan sodium")

A man of 40 was admitted to the Liverpool Royal Infirmary with the history that on three occasions during the previous four days he had vomited a good deal of blood, following "a big feed of meat pies". For some time, and especially for the past six months, he had had pain after food and "indigestion", but he had not bothered much about it, nor had he seen fit to consult a doctor. Nine years ago he had been in the same hospital with right-sided lobar pneumonia.

It was only with difficulty that his own doctor persuaded him to go into hospital, in spite of the repeated vomitings of blood; but he was in poor condition on admission and thought he was going to die. He was very pale and markedly dehydrated, and his blood hæmoglobin, taken after his last hæmorrhage when the secondary dilution of his blood cannot have been complete, was only 40 per cent

With blood transfusions, and large amounts of glucose-salines given intravenously, he rallied reasonably well, despite further vomiting of a small amount of blood. The second day after admission, however, there was a sudden rise of temperature from the subnormal up to 101° F, and the respirations were 40 per minute. He had developed a little grunting cough, and complained of pain in the left side of the chest. Clinical examination made it clear that there must be a centrally placed patch of pneumonia in the left lung, and this was confirmed by the results of immediate radiography of the chest with a portable machine, and the coughing up of small quantities of sticky "rusty" sputum, infected with a mixed growth

of organisms Unfortunately, owing to an error, the pneumococci present were not typed Later the physical signs and X-ray appearances revealed a consolidation of the whole of the left upper lobe

The patient was now delirious, and the outlook seemed desperate Because of the hæmatemeses, the oral administration of drugs, and especially of tablets of M & B 693, was contra-indicated, for any recurrence of the vomiting or bleeding might be dangerous Happily we had by us a supply (through the courtesy of May and Baker Ltd) of the soluble salt, and the intramuscular injection of 3 c.cm of this was started as soon as the clinical diagnosis was made and was continued every four hours

During that night he was gravely ill, but next day his temperature had fallen to normal and he was much better He still needed much fluid, was he to have it intravenously or by mouth? We decided on the latter Over the following two days he made steady improvement, and as he was finding the intramuscular injection of the drug very painful—it is quite alkaline in reaction—it was discontinued The following day the temperature rose to 100° F and the drug was injected again every six hours until the temperature was normal again the next day Since then he has made a steady uneventful recovery, with resolution of the pneumonia, confirmed by X-ray He is now so far improved in his general condition as to be ready for gastro-intestinal radiography

Anyone faced with an emergency such as this must take action on clinical grounds It seemed clear that the hæmatemeses were due to bleeding from a peptic ulcer, and that it was therefore dangerous to treat a complicating pneumonia with tablets of the ordinary M & B 693 It was comforting to have available the soluble salt for parenteral injection The onset of pneumonia in a patient already gravely ill seemed to make the prognosis quite hopeless, and it was surprising and very pleasing to find that after all he did recover We have deliberately reported the case as it stands, for whether further investigations now confirm the presence of a peptic ulcer or not, they would not alter the clinical problem which had to be dealt with in those first few days after admission of the patient to hospital

PNEUMOCOCCAL MENINGITIS

A REVIEW OF 30 FATAL CASES AND A REPORT OF RECOVERY AFTER ADMINISTRATION OF M & B SOLUBLE

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PNEUMOCOCCAL meningitis is rare During the past three years 36,848 patients have been admitted to the general wards of the Dudley Road Hospital and only 30 of these were suffering from it There is no selection of cases at this hospital and no ill patient is refused admission The rarity of the condition is, however, offset by its fatality rate, which before the sulphonamide remedies were introduced was usually accepted as 100 per cent Cases of spontaneous recovery have been reported in America (Allman 1937, Frankmann and Stewart 1937), but there is no record of such an outcome at the Dudley Road Hospital and all the 30 cases to which I have referred were fatal

The age groups of the 30 patients are shown in table I It will be seen that 21 were under ten years of age and approximately two-thirds were under twenty Males numbered 28

Apart from its very high mortality, the disease is noteworthy for the speed with which it kills No patient admitted with pneumococcal meningitis

TABLE I—CASES GROUPED ACCORDING TO AGE

Years—	Under 1	1–5	5–10	10–20	Over 20
Cases	9	7	7	3	13

survived a week in hospital, and 26 of the 30 were dead within three days The diagnosis was confirmed in all cases by lumbar puncture and bacteriological examinations or by autopsy The post-mortem findings in the 19 cases examined are set out in table II It will be seen that bronchopneumonia, lobar pneumonia and otitis media were the common accompaniments In one case no other pathological lesion was present, while in another the only other lesion was pulmonary tuberculosis (pneumococci present in large numbers in the meningeal exudate) In the case with ulcerative endocarditis, pneumococci were found in large numbers on the vegetations on the aortic valve, but the lungs were normal Of

TABLE II—OTHER PATHOLOGICAL CONDITIONS FOUND AT AUTOPSY

	Cases		Cases
Bronchopneumonia	4	Sinusitis (pneumococcal)	2
Bronchopneumonia and pneumococcal otitis media	2	Ulcerative endocarditis (pneumococcal)	1
Lobar pneumonia	4	Pulmonary tuberculosis	1
Otitis media (pneumococcal)	4	No other lesion found	1

the 4 patients with bronchopneumonia 3 were under a year old while all the 4 cases with lobar pneumonia were over twenty Of the 4 with otitis media alone 3 were infants, while those with both otitis media and bronchopneumonia were aged six months and six years respectively These findings are what one would expect, since otitis media and bronchopneumonia are common in the young, while lobar pneumonia is the usual pneumococcal disease of adults

A few cases of pneumococcal meningitis treated successfully with sulphanilamide and its derivatives have been reported, but the following is, I believe, the first reported successful case in which the new soluble sodium salt of 693 was used The preparation is put up in ampoules containing 1 gramme of the salt dissolved in 3 c.cm of fluid, and 1 g injected is stated to be equivalent to 2 g by mouth It is essential to give the injection deeply into the muscle and not into the subcutaneous tissue, or an abscess may result Estimations of the blood content of M & B 693 made at this hospital have shown that a high concentration can be quickly secured by intramuscular injection and maintained by four hourly injections (see chart)

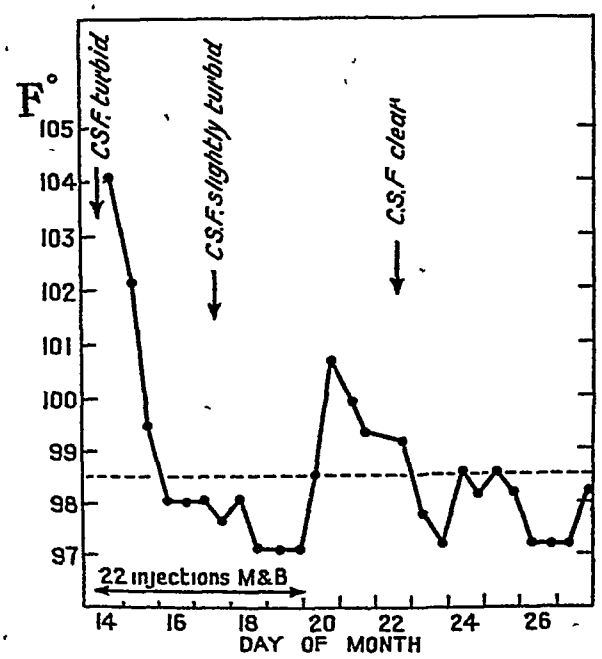
The patient was a girl of 7 admitted on the evening of April 11 with a history of vomiting and headache for three days She was very ill, pale, and slightly sallow, temperature 101°F, pulse rate 130 respirations 30 She was delirious and vomited continually, her neck was stiff, and Kernig's sign was positive Ears normal It was difficult to examine the chest because of the restless delirium, but no abnormal condition was found Lumbar puncture, thin turbid fluid under pressure Laboratory report on cerebrospinal fluid (C.S.F.) pus cells present pneumococci type x grown on culture

Intramuscular injections of M & B soluble (1 c.cm four hourly) were started at once Next day she was still delirious and vomiting, and required small

injections of morphine; but the temperature was falling. On the following day (April 16) it was normal, though there was no change in the general condition, and on the 17th she was still very ill with a threatening bedsore probably at the site of injection. Lumbar puncture produced a pale yellow fluid which looked almost clear but contained pus cells and yielded pneumococci on culture. By next day there was much less vomiting and the child was quieter, the temperature remaining down. On April 19 she vomited only once and showed interest in her surroundings. On the 20th, having now received a total of 22 injections of 1 c.cm., she was languid and weak, but there was no vomiting. On the other hand there was a slight rise in temperature.

On April 21 she was much better, asking for food and denying headache; no neck stiffness. M. & B. 693 by mouth was started, with 0·25 g. two-hourly. Next day she was vomiting again, though there was no headache or meningism. The C.S.F. was now a clear fluid (36 cells per c.mm., chiefly round cells); no organisms were seen in films and there was no growth on culture. The administration of M. & B. 693 by mouth was stopped because it was thought to be causing vomiting (total given 6·25 g.), and two intramuscular injections of M. & B. soluble, each of 3 c.cm., were given during the day. On April 23 the temperature was normal again, and after 0·5 g. of M. & B. 693 had been given by mouth in the morning no more was administered. On the 24th the child was well and very bright mentally. A small sterile abscess was present at the site of one of the injections, where apparently some of the solution was put into the subcutaneous fat. She has since remained well and seems in full health.

As spontaneous recoveries from this disease are on record it would be unwise to make considerable claims on the basis of a single case; but the temperature chart certainly shows rapid improvement after giving M. & B. soluble. The improvement in the child's general condition lagged behind the temperature fall by some two days; but this is what one might expect, for the meningeal exudate of pneumococcal meningitis is usually fairly copious and thick, and delirium, vomiting and meningism might continue until some of it had been absorbed. The second rise in temperature is probably attributable to the formation of the small aseptic abscess,



the occurrence of which shows the need to give the injections deeply into the muscle.

I am indebted to Dr. T. M. Anderson, deputy medical superintendent of the hospital, for permission to publish these cases; to my colleagues for access to their case-records; and to Dr. William Whitelaw for the pathological findings. My thanks are due to Messrs. May and Baker Ltd., who supplied the drug.

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LITHOTOMY-TRENDELENBURG POSITION

FOR RESECTION OF RECTUM AND LOWER PELVIC COLON

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EVERYONE is familiar with the lithotomy and Trendelenburg positions, but I wish to point out some of the merits of using a combination of these two positions when operating on the rectum and lower colon. I have used this method for the past eighteen months and have had time to assess its advantages and eliminate some of its faults.

The aim has been to simplify operations on the pelvic portion of the bowel by placing the patient in such a position that a whole choice of procedures are available without moving or turning the patient once the operation has begun, for it to be possible to work either from the abdomen or the perineum, or alternatively, if there are two operators, for synchronous operating to take place.

I have attained this end by using special supports which are designed to hold the patient comfortably and effectively in this position (fig. 1). They are adjustable so that a patient of any size can be accommodated and, in addition, are designed to put the perineal tissues on the stretch when dissecting in that area, whilst this tension can be diminished when sewing up the perineum. Although my approach to this subject has been an individual one, both Kirschner and Devine have developed methods on similar lines.

It will be seen in figs. 2 and 3 that the abdominal and perineal exposures are a compromise. The best perineal exposure is obtained when the patient's thighs are well flexed and the best exposure of the abdomen when the thighs are extended. Excision of the rectum from the perineum in the lithotomy position will be a new departure for some surgeons, the majority of whom probably use the established left lateral position. This approach is, however, no new one, for it was described by Mayo in 1910 and is now used by many surgeons. Apart from slightly increased trouble in removing the coccyx I think it has every advantage over the left lateral position, since the tissue planes are held more on tension and the left and right sides are exposed equally well.

Some considerable time has been given to developing the special props (supports) for the patient's legs to enable the ideal combined position to be obtained—i.e., the best exposure of both the abdomen and the perineum at the same time. As before mentioned, they are designed to fit any size of patient, the horizontal rod (H) and the vertical part (D) being extensible (see fig. 4). The props are set in the

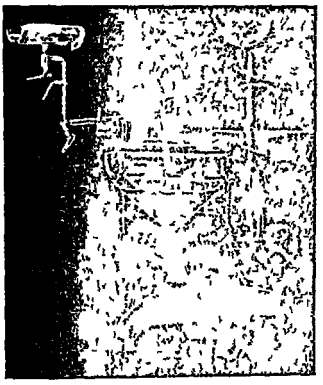

FIG 1—Supports attached to the table

ordinary *lithotomy* rod fixtures Upright A is marked off in inches so that both rods can be readily fixed at the same height, and as a general rule it is found that the horizontal bar (B) should be about five inches above the level of the table The upright (A) has one flattened surface to prevent the prop twisting round, and this flattened surface is cut in such a way that when fixed the horizontal part forms an angle with the edge of the table, giving a greater space between the two ball and socket joints (X), thus enabling the operator and assistant to sit comfortably opposite the perineum The upright (B) can be lengthened or shortened to accommodate any length of thigh and the ball-and-socket joint (X) allows for comfortable adjustment for the calf on the rest (W)

OPERATIVE PROCEDURE

The patient is placed in position after anæsthesia has been induced The legs are placed in the props and the calf rests are well padded with a triple layer of gamgee size 15 in by 12 in quilted and enclosed in a muslin pillow case with tapes for tying in position

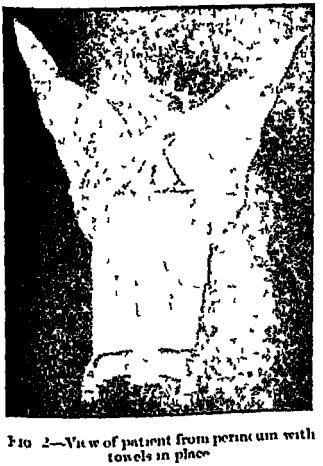

FIG 2—View of patient from perineum with towels in place

The various adjustments are made so that the best combined exposure of both the abdomen and the perineum is obtained The shoulders are supported by extended shoulder rests which are again well padded and take the weight from the acromio-clavicular joints and across the back of the shoulders by means of a narrow pillow The sacrum is lifted from the table by means of two sandbags Sizes 15 in by 5 in and 15 in by 12 in have been found to be satisfactory, and are used as shown in fig 5 The adjustment of the sandbags is important as their maximum lift should be at the greatest convexity of the sacrum—this will give a good exposure of the coccyx and also keep the pelvis in the best position If the sandbags are placed too near the lumbar region the pelvis will tilt away from the abdominal operator, and if they are too far down exposure of the coccyx becomes difficult For males, the penis and scrotum are kept out of the way by strapping them to the right thigh with adhesive tape Lastly, it is advisable to adjust the table in the Trendelenburg position before putting on the sterile towels, so that any downward slip on the part of the patient can be noted and readjustment made to prevent it

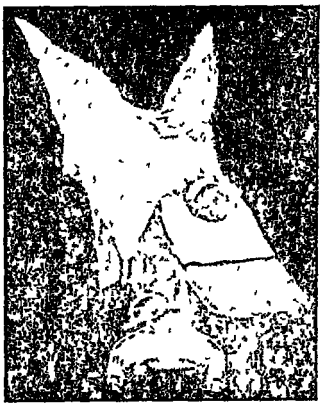

FIG 3—View of patient from the abdomen with towels in place

The arrangement of the patient soon becomes a simple matter which can be accomplished effectively in a few minutes When this has been done and the towels applied, no further alteration in the patient's position is necessary unless the operation turns out to be a completely abdominal one In this case by loosening the ball and socket joints X and Y on both sides the limbs can be extended and an almost full exposure of the abdomen obtained

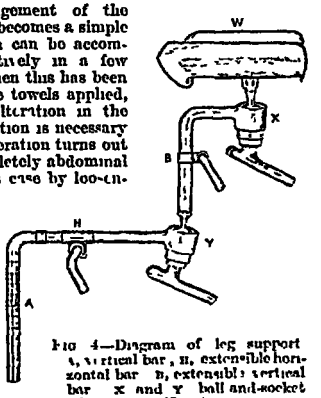

FIG 4—Diagram of leg support A, vertical bar, B, extensible horizontal bar H, extensible vertical bar X and Y ball and-socket joints, W, calf rest

With regard to towels, it should be noted that larger leggings than normal are required, and size 48 in by 54 in by 42 in have been found to be satisfactory

COMMENTS

The advantages of this method are considerable :—

(1) It allows a choice of procedures when the abdomen is opened and the growth is deemed operable An abdomino-perineal or perineo-abdominal excision can be performed with equal facility, and for growths at or above the recto-sigmoid junction a

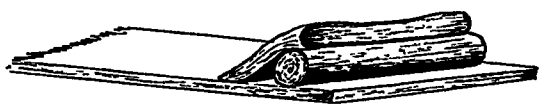

FIG 5—Arrangement of sandbags.

Hartmann's or Paul's operation may be done. The position is also ideal for an abdomino-anal excision with anastomosis and conservation of the sphincter.

(2) The time spent on the essentials of the operation of necessity remains unaltered, but unnecessary waste of time is avoided in the combined excisions—abdomino-perineal and perineo-abdominal—because the patient does not need to be turned This particularly applies to the perineo-abdominal operation in which there are two or three turns

(3) Shock is reduced by the shortening of operating time and the avoidance of turning the patient

(4) In abdomino-perineal operations the peritoneal floor can be closed over an empty pelvis

(5) It is possible to operate from the abdomen and perineum at the same time This requires two operators of experience and naturally results in considerable saving of time in straightforward cases Synchronous operating however is most important in cases in which the growth is particularly adherent, and I think that further developments on these lines will undoubtedly result in an increased operability-rate A number of these operations have now been done satisfactorily, and I propose to discuss this procedure more fully later

There are no serious disadvantages The position is admittedly a compromise, but for practical purposes an excellent exposure of both abdomen and perineum is in fact obtained. It must be realised that special supports are definitely necessary and attempts to use ordinary lithotomy crutches will lead to disappointment and will not give the method an adequate trial The removal of the coccyx, as before mentioned, may be slightly more difficult than when operating in the left lateral position, as its exposure is not quite so good This however is a minor point of little significance.

My thanks are due to Messrs. A. L. Hawkins and Co of New Cavendish Street, London, the manufacturers of the supports, and also to Mr. H. R. Bussey and Mr. V. L. Hardwick for the illustrations

INTERNATIONAL COURSE IN BALNEOLOGY.—An international postgraduate medical course in balneology is to be held in Budapest from Oct 2 to 8 Among those who will deliver lectures are Prof H. Vogt (Breslau), Prof. S. Graff (Hamburg), Geh. San.-Rat P Köhler (Bad Elster), Prof A. Slauck (Aix-la-Chapelle), Prof. F. Coste (Paris), Prof E Wybauw (Brussels), Prof E. Pisani (Montecatini), Prof. H Salvesen (Oslo), Prof. Ö N Holsti (Helsinki), Dozent E Folke Lindstedt (Stockholm) and Prof. M Neskovic (Belgrade) Further information may be had from the Central Committee for Postgraduate Education in Hungary, Eszterházy-utca 9, Budapest VIII.

LEUCO-ERYTHROBLASTIC ANÆMIA RESEMBLING ACHOLURIC JAUNDICE

BY H. C. LUCEY, M.D Lond., D.P.H.

PATHOLOGIST TO THE METROPOLITAN HOSPITAL, LONDON

A PORTER, aged 61, was sent to the Metropolitan Hospital from the outpatient department of another hospital, where several blood-counts had been done and lymphatic leukæmia diagnosed He said that his illness started with an attack of "influenza" five months previously, since when he had lost weight and become progressively paler and yellower.

CLINICAL RECORD

He had had no serious illness previously and no jaundice; nor was there any history of jaundice among his relations.

On admission he was obviously anæmic with a distinct icteric tinge. Temperature, pulse, and respiration normal. The spleen was enlarged 1½ in below the costal margin, and the liver was also slightly enlarged, ¾ in. below the costal margin. A small area of dullness was detected at the right apex behind

A *blood-count* gave the following results :—

Red cells	1,350,000	Polymorphs	67%
White cells	20,000	Lymphocytes	24%
Hæmoglobin	36%	Monocytes	3%
Colour-index	1·33	Eosinophils	2%
		Myelocytes and other immature forms	4%

The white-cell count at first appeared to be 35,000 per c.mm., but, on examination of a stained blood-film, numerous nucleated red cells were seen They numbered 75 per 100 white cells, and it was at once realised they had been included in the total white cell count (Nucleated red cells resist hæmolysis in acid distilled water, used for diluting and laking the blood, and appear in the hæmocytometer as small lymphocytes They are also liable to be mistaken for lymphocytes when a non-laking stain, such as Toison's fluid, is used for diluting both the red and white cells together) Therefore 75 out of the 175 cells in the hæmocytometer were nucleated red cells, and the true white-cell count was 35,000 minus 15,000 = 20,000 per c.mm It was doubtless due to the non-recognition of this snag that the original wrong diagnosis of lymphatic leukæmia was made, though examination of a blood-film should have put the observer right.

The nucleated cells were normoblasts, early and late erythroblasts, and an occasional megaloblast. The erythrocytes showed considerable anisocytosis, punctate basophilia, and polychromasia, but poikilocytosis was not a feature. Eve's halometer reading was 4·4, which corresponds to a modal mean diameter of 7·81 μ The anæmia was therefore macrocytic and hyperchromic. Reticulocytes reached the high figure of 45 per cent

Van den Bergh reaction—Direct reaction negative. Indirect reaction positive: bilirubin 2·5 mg. per 100 c.cm. (5 units).

Diagnosis.—On these findings a provisional diagnosis of pernicious anæmia was made and treatment with liver and iron started. True, a leucocytosis of 20,000 per c.mm was against pernicious anæmia, but occasionally cases of this disease are met with, especially when there is a septic focus when the more usual leucopenia is replaced by a leucocytosis For confirmation a fractional test-meal was done. This, however, showed a normal acid curve.

The diagnosis of pernicious anæmia was therefore discarded and acholuric jaundice considered. A red-cell fragility test showed hæmolysis starting in 0·7 per cent. saline and complete in 0·45 per cent. saline. A normal control put up at the same time

showed the normal result—lysis starting in 0·45 per cent and complete in 0·3 per cent saline. Such an increase in the red cell fragility, taken in conjunction with the clinical signs—namely, jaundice associated with a positive indirect and negative direct van den Bergh reaction, enlarged spleen, and slightly enlarged liver—appeared to clinch the diagnosis of acholuric jaundice. Further, the leucocytosis with a few immature white cells, the large number of nucleated red cells, the high colour index, the high reticulocyte-count, and the absence of poikilocytosis were all in favour of this diagnosis. It might be objected that the red blood cells were not the typical small globular cells found in this disease, but in a crisis "in adults particularly there may be a marked macrocytosis rather than the characteristic apparent microcytosis, this occurs especially when the count is low" (Whitby and Britton, 1937).

Course of illness.—A second blood-count, done eleven days after admission, showed a distinct worsening of the condition. The hæmoglobin had fallen to 26 per cent and the red cells to 900,000 per c.mm. Colour index 1·14. The nucleated red cells now exceeded the white cells in the proportion of 125 to 100. The false total white cell count was 45,000 per c.mm. and the true count 45,000 minus 25,000 = 20,000 per c.mm.

A blood transfusion (450 c.cm.) given at this stage had a striking effect. The hæmoglobin and red cells rose steadily, while the nucleated red cells and other abnormal forms fell rapidly. The patient's complexion changed from a lemon-yellow to a rosy pink. His weight increased slightly and his general condition steadily improved, so that in a few weeks he was allowed to get up. Liver and iron were still being given.

In the 11th week the red cells showed the same high degree of fragility as on admission, but the nucleated forms had now disappeared.

In the 20th week the reticulocyte count was 1·6 per cent. The accompanying chart shows the red cells about this period increasing at a greater rate than the hæmoglobin, so that the two curves cross. After this the colour-index remains less than unity. Stained films made about this time showed the red cells to be uniform in size and shape and rather small. There were no abnormal forms. Several haloometer observations gave an average reading of 5, which corresponds to a modal mean diameter of 6·88 μ. The blood picture had in fact changed from macrocytic and hyperchromic to microcytic and slightly hypochromic.

Revision of diagnosis.—At this stage the question of splenectomy was being considered, when the illness took a sudden and dramatic turn. Œdema of the right arm and upper part of the right chest set in. This focused attention on the small area of dullness which, on admission, had been noted at the apex of the right lung, and it was found to have increased both in extent and intensity. A radiogram showed a dense area of opacity in this zone. Besides this development, palpation of the right side of the neck revealed some slightly enlarged lymph-glands. Carcinoma of the lung, with lymphatic spread to the right arm and chest and to the cervical glands, had now to be considered. A cervical gland was removed, and section showed it to be infiltrated with carcinoma. The histological picture was peculiar, owing to the relatively large amount of clear or foamy cytoplasm, due to fatty degeneration, possessed by the anaplastic cancer cells. So again the diagnosis had to be altered. This time it was changed to primary carcinoma of the lung with leuco-erythroblastic anæmia.

This type of anæmia, when due to carcinoma, is always associated with secondary deposits in the bone marrow, which is stimulated to turn out both white and red immature cells. Radiograms at this stage, however, failed to reveal any deposits. (They were found post mortem.)

Terminal phase.—Iron and liver were now stopped, but in spite of this and the spread of the cancer, the blood, curiously enough, continued to improve, and by the 25th week the red cells had reached the 5 million mark. A fragility test done at this stage showed lysis starting in 0·5 per cent saline—a decided approach to normal. Thereafter, though his physical condition began to deteriorate, the patient developed a troublesome cough, his appetite failed, and he lost weight, his red cells and hæmoglobin dropped only slightly. A leucocytosis persisted throughout the illness. His temperature on the whole kept pretty steady, with only occasional rises to 99° or 100° F. Death took place in the 36th week after admission.

FINDINGS

Post-mortem.—Only those tissues and organs showing pathological changes are here described.

Lungs.—The whole of the upper lobe of the right lung was solid and so firmly adherent to the chest wall that it could not be removed without leaving portions behind. Microscopical section showed an anaplastic carcinoma which had arisen in an old tuberculous focus. A solid nodule, the size of a small walnut, was found in the upper lobe of the left lung. This at first was thought to be a secondary growth, but microscopical section proved it to be an active tuberculous focus. A *lymph-gland* removed from the bifurcation of the bronchi showed, on section, a combination of miliary tubercles and infiltration with secondary carcinoma, the cells of which were anaplastic and fatty like those found in the cervical lymph-gland.

The *liver* was enlarged and studded with secondary deposits. Microscopical section showed the carcinoma cells to be less anaplastic and less fatty than in the lung and lymph-glands. These were in solid columns with, here and there, incipient acinous formation. Free iron was present. The *spleen* was also enlarged (weight 12 oz.), free iron was present in abundance. Both *adrenals* were enlarged, with secondary carcinomatous deposits. An *abdominal lymph-gland* proved to be infiltrated with growth. Here the carcinoma cells were of two types

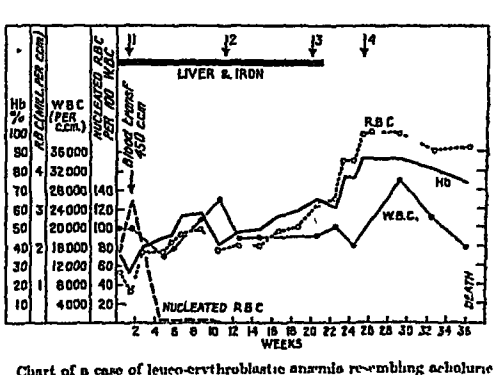

Chart of a case of leuco-erythroblastic anæmia resembling acholuric jaundice. Hb, hæmoglobin; R.B.C, red blood corpuscles; W.B.C, white blood corpuscles. Arrow 1: reticulocytes 45 per cent; hæmolysis in fragility test starts in 0·7 per cent saline. Arrow 2: hæmolysis starts in 0·7 per cent saline. Arrow 3: reticulocytes, 1·6 per cent. Arrow 4: hæmolysis starts in 0·5 per cent saline.

the fatty anaplastic variety already described and deeper-staining cells in acinous formation.

Humerus.—The left humerus was removed and sawn through its whole length. The marrow was obviously hyperplastic throughout, of a deep red-purple colour containing a few small pale patches. A microscopical section of one of these pale patches showed large, fatty, and lightly stained carcinoma cells, identical with those found in the lung and lymph-glands

Right axillary fold.—Since the tissues in this region were so much hardened and thickened, a microscopical section was made to determine if carcinomatous involvement of the lymphatics, as a direct spread from the lung adherent to the chest wall, had taken place. This was plainly shown to be the case, and was the cause of the solid œdema of the right arm and chest.

DISCUSSION

Icterus gravis in the newborn and acute hæmolytic anæmia at any age, may both show a slight increase in red-cell fragility; but I can find no reference to any disease, other than acholuric jaundice, in which a considerable increase in red-cell fragility is described In acholuric jaundice it is the characteristic feature and commonly reaches 0·7 per cent saline. The chief interest in this case of proved leuco-erythroblastic anæmia associated with carcinomatosis lies in the fact that it resembled acholuric jaundice so closely, even to the high degree of fragility of the red cells Fragility tests done on two subsequent cases of leuco-erythroblastic anæmia, with carcinomatous deposits in the bones but no jaundice, gave normal results; but Vaughan and Harrison (1939) have found slightly increased red-cell fragility in two cases of leuco-erythroblastic anæmia associated with myelosclerosis. How far the associated tuberculosis affected the blood-picture in the case here described it is impossible to say As for carcinoma of the lung starting in an old tuberculous focus, that is well known; but I have no knowledge that the reverse process has ever been described. It appears that in this case the implantation of the carcinoma on the site of the old tuberculous focus awakened its activity The dense adhesion of the lung at this part to the chest wall was evidence of a lesion of long standing

It is possible that some cases of so-called acquired acholuric jaundice may really be unrecognised cases of leuco-erythroblastic anæmia At any rate this case shows the importance of excluding the latter disease by a thorough search of the body for a primary malignant growth and by radiography of the bones for secondary deposits, whenever a diagnosis of acholuric jaundice, largely based on increased red cell fragility, is unsupported by a history of previous attacks of jaundice in either the patient or his relations It was fortunate that this case revealed its true nature before splenectomy was performed

My thanks are due to Dr. Norman Hill for permission to use the clinical notes of his patient.

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MEDICAL SOCIETIES

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

AT the twenty-fifth annual conference of this association, held in Belfast from June 29 to July 1, with the Marchioness of TITCHFIELD, the president, in the chair, a discussion on the

General Administration of Tuberculosis Schemes

was opened by Alderman E. H. RICKARDS, J.P., who divided the administration of a tuberculosis scheme into four sections (1) Discovery and diagnosis: there were, he thought, still too many people in whom the early stages of the disease remained undetected owing to the difficulty of persuading some people to submit to examination and owing to the lack of propaganda whereby general practitioners might be made acquainted with the existing facilities (2) Treatment: there were few administrative difficulties here except insufficient accommodation to meet the long waiting-list of some authorities (3) Isolation and prevention: much success had followed the use of shelters and separate sleeping accommodation, education in hygiene, and rehousing schemes. (4) Care and aftercare of the patient and his family: the funds of care committees could not rise to every type of assistance necessary, and difficulty was often met in the case of the young bread-winner discharged from sanatorium as fit for "light work," because light work was almost unobtainable So far no serious effort had been made to find suitable work for these patients, and he suggested the setting up of workshops in connexion with a sanatorium at which discharged patients could be profitably employed for regulated hours.

Dr ANDREW TRIMBLE said that any such scheme must concern itself both with the care and cure of the patient and with the prevention of a further spread of the disease, for the decline in mortality was due more to the limitation of infection than to cures He outlined the development and progress of anti-tuberculosis measures in Belfast (where the death-rate had dropped by 67 per cent. from 1914 to 1938), put in a plea for a periodic review of any scheme, and suggested certain lines along which fresh endeavour might be directed, such as a study of the whole individual as a social unit, the cultivation of the health habit, and the training of school teachers in recognising suspicious signs of oncoming disease

Dr. W L YELL looked upon the tuberculosis dispensary as the foundation of all schemes, hence the choice of a tuberculosis officer and nurse were of prime importance He maintained that patients with early pulmonary, bone, or joint tuberculosis and those in an advanced stage of pulmonary disease should be given prior claim to institutional treatment, the intermediate group being best catered for by the colony system, which should be more generously subsidised. Dr Yell then referred to the success of a small maternity unit at one of the Essex sanatoria to which patients are admitted six weeks before term and retained for three to six months after delivery. This, it was hoped, would banish many of the dangers attached to parturition in tuberculous women

Dr P W EDWARDS, in a paper on

Arrangements for Artificial Pneumothorax

said that, before an artificial pneumothorax was induced, the operators should make sure that there were adequate facilities for carrying on the treatment These facilities he divided into "essential" and

"desirable" The former included an experienced physician, a thoracic surgeon, an X ray equipment for screening and taking pictures, and a suction apparatus for trocar and cannula The "desirable" facilities included a rapid gas replacement apparatus, an operating theatre for internal pneumolysis and phrenicectomy, and a quick method for sterilising needles in bulk

Dr B R CLARKE computed that 50 per cent of all patients with open pulmonary tuberculosis required a pneumothorax He regarded the induction as often a matter of urgency and deplored the lengthy wait for accommodation that was often encountered He emphasised the need for experience in spacing refills and preferred frequent small refills controlled by screening Since the main object of a pneumothorax was to bring about the lasting cure of the patient, the mental and physical reaction of the patient to the treatment should be constantly studied

Dr BRENDAN O'BRIEN considered the control of carriers to be the most important point in the prevention of tuberculosis, and this could be effected only by early diagnosis and adequate treatment There was a tendency to use the artificial pneumothorax as a substitute for sanatorium treatment, whereas they should be complementary, and he was opposed to inducing a pneumothorax without a preliminary period of observation

In the discussion that ensued Dr GEORGE DAY hoped that tuberculosis officers and others with charge of pneumothorax patients would be provided with facilities for screening and radiography This was not universal at the present time, with the result that the lung was either too much collapsed or there was a risk of the pneumothorax being lost

On the second day, with Sir PERCIVAL HORTON-SMITH HARTLEY in the chair, Dr GEORGE JESSEL, opening a discussion on

Tuberculosis in the Adolescent

said that the adolescent and young adult population had not participated in the continuous decline in the tuberculosis death rate from 1901 to 1909, but that from 1933 onwards a steady fall had been noticed After mentioning the possible predisposing factors that had been investigated by other workers, such as shortage of food, fatigue, work, and worry, he concluded that, apart from shortage of food, which the Registrar General thought significant in explaining certain periods of arrested fall, no single factor was responsible With regard to treatment the outlook had become more favourable, but treatment must be applied early Rest was the most important item, and artificial pneumothorax was useful in suitable cases On the preventive side the examination of contacts should be compulsory and universal. One examination was not enough, they should be kept under observation for at least five years

Dr F S HAWKINS cited the figures for Wales as showing the highest incidence of the disease to be in the adolescent age group, and to account for this he invoked poor housing and poor food, the anxiety of finding a job, and the struggle to retain it Certain symptoms should be regarded as danger signals, such as a constant succession of colds, aphonia, lassitude, a failure to gain weight, and amenorrhœa Treatment should be prompt and prognosis guarded, especially in young women, and an annual radiographic examination of all persons between 14 and 21 was desirable if prevention was to be ensured

Dr D S PRICE said that the primary infection of childhood should not be regarded as benign, for it might progress to more serious manifestations There were now more tuberculin negative adolescents in the community than thirty years ago, and as a result more people were becoming infected for the first time relatively late in life In Eire, for example, only 11 per cent of healthy girls of 14 in the country gave a positive reaction She thought there was a connexion between this and the high death rate in the 15–25 age group, and she asked for more consideration to be given to the negative reactor

Mr A R FOSTER, headmaster of the Belfast Royal Academy, attacked the present day system of education as fostering the spirit of mental cruelty. He illustrated his points by recounting a day in the life of an average pupil aged 16, in which the child was compelled, by his teachers during the day and his parents in the evening, to expend a sum total of physical and mental energy that would make the day's work of a coal heaver "look like a pleasant afternoon in the garden" He preferred quality rather than quantity in academic learning and thought that these deficiencies in our educational system were predisposing factors to tuberculosis.

Alderman P ASTINS, J P, drew attention to numerous gaps in the present legislative framework and the need for amending such legislation so as to make the local authorities responsible for many social activities now only permissive He laid particular emphasis on the need for adequate rehabilitation of a patient when he left sanatorium, and he suggested that the state could profitably reserve a proportion of its lighter jobs for such people, as indeed it did already for the disabled ex Service man.

Dr W M MACPHAIL gave an account of the occupational training at Burrow Hill Sanatorium colony Unfortunately there was not time for details, but he said that about a third of the patients stayed at the colony the full length of time and these had little difficulty in finding suitable employment in after life

Dr LLOYD RUSBY distinguished between the tuberculous and the catarrhal [illegible] in a contact community and suggested that [illegible] research should in future be devoted to a study of the constitutional factor with the object of early recognition of susceptibility rather than the established disease

Dr BANSZKY described the [illegible] technique of photographing the fluoroscopic image This had a bearing on the question of mass radiography for a permanent record could be obtained for a film

Dr J B MCDOUGALL [illegible] discussion on

Architecture [illegible]

from the points of view of [illegible] who was satisfied if a [illegible] of the patient, [illegible] and recreative [illegible] as his temperament [illegible] whose main [illegible] brief for the [illegible] an enormous [illegible] cited the [illegible] which [illegible] less than [illegible]

Mr [illegible] also [illegible] and [illegible] in [illegible] favour [illegible]

compactness, with administrative and clerical services centralised and the patients confined to the ground floor He condemned the use of radiators as heating by convection and preferred the radiant type of ceiling heating with steel pipes through which hot water could be passed

Dr. BLYTH BROOKE said that a tuberculosis dispensary both externally and internally should be one to inspire confidence and create a friendly and homely atmosphere He outlined the details of lay-out and illustrated his points with a plan of the Finsbury health centre

Dr E. K. PRITCHARD, with experience of the new health services at Southwark, said that he was not in favour of conditioned ventilation, because it required closed windows and it was sometimes difficult to convince the tuberculous patient that you were practising what you preached

Dr. F. R G HEAF thought well of Dr. McDougall's new hostel in view of the increased general demand for bed accommodation, and Mr. S. LOUTIT said that the designing of a tuberculosis institution should be the job of an outside architect and not of a borough surveyor.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

AT a meeting of this society in Newcastle-on-Tyne on May 10 Prof. E. FARQUHAR MURRAY, the president, delivered his presidential address, entitled

Retrospect, Introspect, and Prospect

outlining the main changes in gynæcological practice which had taken place since 1911. Perhaps the most striking change was the development of a sound pathology which took regard of the whole patient. This was exemplified by the alteration in the treatment of retroversion and prolapse. In London in 1911 a third to a half of the laparotomies performed were for antefixing the uterus. As a conclusion to prolapse operations it was known to irreverent juniors as the "all red route" After such a training it was a relief to find that there were many backaches and very few retroverted uteri as a cause When he came to Newcastle in 1919 he found that ventrofixation had not been done for many years, although numerous papers were still being read advocating it To the Manchester school belongs much of the credit for establishing that a thorough plastic vaginal repair was sufficient to cure prolapse

During the same period there had been a swing of the pendulum from radical surgery to conservatism. Fortunately the clean pelvic sweeps preferred by those who considered a tidy pelvic basin as of prime importance were less common now. Years ago he had been told by a general practitioner that those who believed in removing ovaries should be made responsible for the patients' aftercare The replacement of hysterectomy by myomectomy in suitable cases was another instance of the same change in outlook On the other hand, much of the conservative surgery practised had been unsound—e g, the performance of salpingostomies without proof of any patency between the tube and the uterine cavity. Hormone therapy certainly was one of the main bulwarks of conservatism, but he wished there were a more satisfactory method of testing the preparations before the market was flooded at great expense to the hospitals

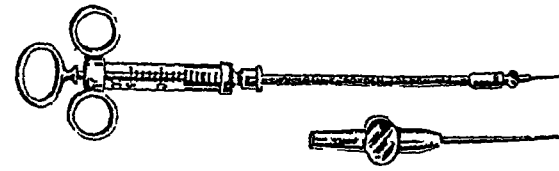
In obstetrics perhaps the most striking advance he had seen had been the almost complete disappearance of craniotomy and its replacement by cæsarean section Although the universal desire to provide anæsthesia for women in labour was commendable, under the present imperfect organisation of maternity services the idea that every midwife should have a powerful drug or apparatus at her disposal for every case was both dangerous and impracticable As a matter of fact the vast majority of women passed through labour without any analgesia at all and took no harm whatever By a judicious administration of the old-fashioned drugs it was possible to ensure a reasonably comfortable labour and a shorter and not intolerable second stage For most women nature was not so terribly unkind as she was made out

In the teaching of obstetrics one of the faults of the present system was the absence of a senior resident with the necessary standing in hospitals where junior residents were being taught their job. There was also a shortage of posts where men could learn postgraduate obstetrics. With the evolution of maternity services there would be an increased demand for general practitioners with such experience, and in some way this problem of instruction must be solved. The provision by most public-health authorities of a comprehensive consultant obstetric service was commendable, although some places had ignored the doctors and displaced them entirely in favour of whole-time officers Such a step had the most adverse effect.

NEW INVENTIONS

A SYRINGE FOR SIALOGRAPHY

IN several cases I have experienced difficulty with the usual syringes in injecting Lipiodol into the salivary ducts prior to sialography, and I have therefore designed the new type shown in the figure



This syringe, which is made by John Bell and Croyden, has rendered the technique of injection more precise and less irksome for both the patient and the operator.

HAMILTON BAILEY, F R.C S.

AN ELECTRIC UVIOMETER

Messrs. Henry Allday and Sons of 19, Warstone Lane, Birmingham, 18, have designed their new "A-T" uviometer on the principle of the photo-electric photographic exposure meter, the scale being calibrated directly in units of erythema dosage. The apparatus is easily portable, being some 5 in. long by 3½ in. wide and 2 in. deep. It is said to be sensitive to radiations of between 2800 and 4000 Angstrom units, the glass filter absorbing most of the radiations within the visible spectrum. If this is so it will register only the therapeutically valuable rays of a mercury-vapour lamp. It should be useful for comparing the emission of different sources of ultraviolet light or for estimating the deterioration of a lamp after long use. The uviometer costs 15 guineas.

REVIEWS AND NOTICES OF BOOKS

British Encyclopædia of Medical Practice

Vol XI By Various Authors Under the general editorship of Sir HUMPHRY ROLLESTON London Butterworth and Co 1939 Pp 730 35s

WITH the publication of this volume the editors—presumably with thankfulness—are nearing the end of their herculean task. Of the 36 articles the one by the editor in chief on the normal and pathological aspects of old age is worthy of special comment In a wise and sympathetic survey Sir Humphry Rolleston defines normal old age as "the process of inevitable involution which leads to normal death" Attempts at rejuvenation, whether by operative methods or hormonal therapy, are he thinks alike to be deplored Another important and succinct article is Dr John Rickman's on sexual behaviour and abnormalities Of the two methods of treating abnormalities, psycho analysis and suggestion, Dr Rickman thinks psycho analysis the more durable and on the whole the more satisfactory, in spite of its length and cost—much depending, it may be added, on the skill and integrity of the psycho analyst The immense potentialities of the new and fascinating knowledge about sex hormones are presented in a tripartite article in which Prof E C Dodds deals with their sources and constitution, Dr P M F Bishop with the therapy of menstrual and menopausal disorders, and Dr G L Foss with the use of male hormones

Sciatica is considered by Dr C W Buckley, who points out that the term is a loose one denoting merely pain in the distribution of the sciatic nerve whether due to a neuritis of the nerve trunk or of its components (root sciatica), or referred from an adjacent structure The various kinds of injection treatment are carefully described and Dr Buckley brings out the growing importance of orthopædic measures in refractory cases The accounts of injuries and diseases of the spine by Sir John Fraser and Mr J J Mason, and those of the spinal cord by Dr F M R Walshe, Mr Harvey Jackson and Dr J St C Elkington together occupy a hundred pages

The fact that involuntary sterility in marriage is often amenable to successful treatment, provided that both partners are willing to undergo thorough investigation, is not as yet fully appreciated either by the public or the profession Mr Eardley Holland explains the position clearly, but he is not always quite up to date. Dermatology is extremely well handled throughout the encyclopædia, and Dr Sydney Thomson's article on scleroderma and Dr Arthur Whitfield's on skin affections due to insects and acarines fully maintain the standard.

Like its predecessors this volume is profusely and beautifully illustrated

Shock and Related Capillary Phenomena

By VIRGIL H MOON, A.B., M.Sc., M.D., professor of pathology, Jefferson Medical College, Philadelphia, director of laboratories, Jefferson Medical College Hospital London Humphrey Milford, Oxford University Press 1938 Pp 112 21s

THERE has been no monograph on traumatic shock since Cannon published his book in 1923 and therefore the appearance of this work must attract attention, especially as Cannon himself contributes a short introduction The first eight chapters give a summary of the pathology and physiology of the capillaries, and in this part of the book the important contributions of Krogh and Lewis are well summarised There follows a brief account of the various theories of shock with special emphasis on the theory of traumatic toxæmia Most of the evidence in favour of this theory is already twenty years old and Prof Moon makes little mention of the mass of contrary evidence published in recent years He believes so firmly in traumatic toxæmia that he gives as his original contribution to the shock problem the post-mortem appearances of a fatal syndrome produced in dogs by implanting portions of striated muscle removed from other animals into the peritoneal cavity The remainder of the book is occupied by brief descriptions of such varied conditions as anaphylactic shock, heat stroke, diabetes, diphtheria, cholera, mercurial poisoning and intestinal obstruction The work is an excellent treatise in support of the theory of traumatic toxæmia, but the individual reader must decide how far it clarifies his ideas on shock and how far it increases his confusion

Essentials of Medical Electricity

(8th ed.) By ELKIN P CUMBERBATCH, B.M. Oxfd., F.R.C.P., D.M.R.E., medical officer in charge of electrical department and lecturer on medical electricity at St Bartholomew's Hospital, London London Henry Kimpton 1939 Pp 528 12s

IN this edition, which was published just before his death, Dr Cumberbatch has been able to include much new material without seriously increasing the size of the volume or its moderate price No book on the subject now contains less that is unnecessary or more that is of real importance to the average medical man In chapter 26, which forms an index of medical treatment, he will find a well balanced account of the general trend of electrotherapeutics as well as of its value in individual diseases Electrical testing is clearly described and the more obsolete methods have now been curtailed The various kinds of diathermy, the most interesting and probably the most important of the forms of electrical treatment, fill about a fifth of the book. The uses and dangers of surgical coagulation in malignant diseases are set out fully, but it is surprising that Dr Cumberbatch does not refer to the opinion held by many electrotherapists that malignant cells are especially susceptible to the action of heat and may therefore be destroyed at a temperature that is not high enough to coagulate normal tissues By the application of this principle some of the risks of surgical diathermy may be avoided.

The influence of the author's trip to America is evident and has sometimes led him to do less than justice to continental workers For instance, de Keating Hart published his paper on bipolar fulguration in 1907 It is difficult to see how this differs from electro desiccation, which Dr Cumberbatch says was devised in the United States by W L Clark, whose first paper was published in 1911 Dr Cumberbatch says that diathermy was first used in England by Dr F Nagel-chmidt in October, 1910 Actually it was used six months before on a patient of Sir Arbuthnot Lane's, and an account of this case was subsequently published. It is strange that there is no reference to the medical use of diathermy in trigeminal neuralgia But these are small points, and do not detract from the general excellence of the book.

The Relief of Pain

A Handbook of Modern Analgesia. (2nd ed.) By HAROLD BALME, M.D. Durh., F.R.C.S., D.P.H., formerly professor of surgery and dean of the school of medicine, Cheeloo University, China. London: J. and A. Churchill. 1939. Pp. 399. 12*s.* 6*d.*

IN this edition the author has included many new ideas and methods and a chapter by Miss Marjorie Houghton has been added on the nursing of pain. Dr. Balme ranges over the whole field of medicine, surgery, obstetrics, gynæcology, and the specialties, describing the clinical features and therapeutics of aches and pains big and little and from top to toe. Of necessity much of his material is compiled from the writings of others, untested by his own experience, but the compilation is concise as well as comprehensive, the main interest is strictly practical, and there is a large and well-arranged bibliography. The result is a useful and stimulating book, by an author most appropriately named.

China at War

By FREDA UTLEY. London: Faber and Faber. 1939. Pp. 306. 12*s.* 6*d.*

Miss Utley, whose thoughtful study of Japanese economic and military strength, published three years ago under the arresting title of "Japan's Feet of Clay," brought her into the front rank of writers on far-eastern problems, has just returned from China where she was one of the very few British newspaper correspondents in the war zone and the only Englishwoman to visit the Yangtse fronts. Her book provides a dramatic record of the effect of modern warfare upon the Chinese nation. We see, as on a screen, the result of air-raids on crowded cities; we hear the moaning of the women over dead and mutilated children; we watch the procession of homeless thousands, from villages deliberately destroyed by advancing armies or razed to the ground as part of the "scorched earth" policy; we note the philosophic patience and dauntless courage of the suffering peasants; and we wonder afresh what will be the outcome of this unequal struggle.

But although largely taken up with the political implications of the present conflict, Miss Utley's book is no mere political propaganda. It is a fine attempt to depict events as she saw them, and in her description of the field medical services she is unsparing in her criticism of the corruption, the inefficiency and the nepotism of the army medical corps. Lacking in the most rudimentary forms of equipment, deficient in trained personnel, and devoid of any adequate preparation for the transport and care of the wounded, the corps did little but provide bare board and lodging for such casualties as could secure a lift on an ammunition lorry, or could somehow drag themselves to the nearest military hospital. Her record is not, however, all painted in sombre colours, for she gives an account of the heroic efforts being made by the Chinese Red Cross, under the leadership of Dr. Robert Lim, to repair the terrible defects in the medical service. Encouraged and supported by General Chiang Kai-Shek and his gifted wife, and working in close harmony with Surgeon-General Loo Chi-teh, Dr. Lim has recruited a large number of well-qualified civilian doctors; he has established a fleet of mobile units, to operate between the field and the base hospitals; he has equipped a limited number of hospitals with expert staff and adequate supplies; and he has organised a system of intensive training for old army doctors, dressers, first-aid attendants, and hospital orderlies. In the carrying out of this effort he is appealing for practical assistance and no reader of Miss Utley's narrative could fail to sympathise with Dr. Lim's appeal.

Physiology of Muscular Activity

(2nd ed.) By EDWARD C. SCHNEIDER, M.P.E., Ph.D., D.Sc., professor of biology at Wesleyan University, Middletown, Connecticut. London: W. B. Saunders Co. 1939. Pp. 428. 14*s.*

THE physiological basis of muscular activity in so far as it has a bearing on physical fitness is now a question of national as well as of scientific importance. Accurate and up-to-date information will be found in this book, where in less than 500 pages a very complete account of the experimental and applied aspects of physical activity is presented. The first part is devoted to the functional contributions of the organs and systems concerned. The account of the physiology of muscular contraction has been revised in the light of modern knowledge but fortunately has not become too intricate. Muscle metabolism, the rôle of oxygen and respiration are explained lucidly, and the blood, heart and circulation receive due attention. Throughout these chapters there are innumerable practical examples in which the physiological reactions are given quantitative expression for specified types of exercise. The later chapters deal with the application of these principles to the problem of physical fitness. The effect of repeated exercise in promoting the improvement associated with "training" is fully discussed. The harmful effects of excessive or uncontrolled activity are considered in relation to fatigue and to staleness. A detailed account is given of various tests for physical fitness and this should be of great value to workers who have to examine recruits or candidates for work which demands a certain standard of fitness. Finally there are chapters on physical exertion under certain specified conditions such as in heavy industry, with varied external temperature, and at high altitudes. The book can be strongly recommended both for its scientific quality and its practical outlook.

Urology

(4th ed.) By DANIEL N. EISENDRATH, M.D., consulting urologist, American Hospital, Paris; and HARRY C. ROLNICK, M.D., attending urologist, Michael Reese, Mt. Sinai and Cook Co. Hospitals, Chicago. London: J. B. Lippincott Company. 1938. Pp. 1061. 42*s.*

SEVERAL important advances have been made in urology since the appearance of the third edition of this work four years ago, and these have necessitated a complete revision of the text. A large number of the illustrations that appeared in previous editions have been replaced, and new sections have been added on cystometry as a help to diagnosis in urinary dysfunction of the bladder, and on the diagnosis and operative treatment of adrenal hyperplasia and neoplasm. There are also new chapters on genito-urinary diseases in women and in children.

By concentrating attention on diagnosis and general lines of treatment, and by avoiding unnecessary descriptions of operative technique, the authors have succeeded in incorporating all this new matter without any considerable increase in the size of the volume. Their original aim has been kept in view—that of simplifying urology for teaching purposes—and, though it is one of the most complete, this is still one of the most readable works on the subject.

THE LANCET

LONDON SATURDAY JULY 8, 1939

STANDARDS OF FITNESS

GALSWORTHY divides human beings into two classes The first maintain that whatever is is right, the second that whatever is is wrong For a long time the second class have told us that we are a C3 nation, underfed and under exercised While admitting that the standardised death-rate fell during the last third of the nineteenth century from 21 to 17 per thousand, and during the first third of this century to about 13 per thousand, they say that it does not follow that the national stamina has improved to a corresponding degree In this they have the backing of the dietitians, who say that at least half the population—that half moreover who produce more than their share of children—do not get enough to eat They have also been able to quote the Army Council, who said "the present position (in 1935) is that if three men come forward to enlist one is rejected on sight, the second is rejected for physical, mental or educational reasons, and the third is finally approved" The medical examination of militiamen has, however, given them a severe setback Instead of the 66 per cent of rejections that they might have forecasted, of the first 50,000 men examined only 2 6 per cent were found to be unfit for any form of military service, 92 5 per cent were passed as fit to be called up for training, and the remaining 4 9 per cent as fit for the lighter jobs in wartime The politicians have lost no time in making capital out of these surprising findings "I should have thought," said Mr ERNEST BROWN, "that every member of the House, and everybody outside, would be proud of the fact that our social legislation within the last thirty years has given us these great results" But the triumphs of social legislation can hardly explain the discrepancy between the acceptances for the militia today and for the army only three years ago, and suggestions have been made in Parliament that the examination of the militia is inadequate and (provocatively) that "under any circumstances the men have got to be inside the armed forces"

The main reason for the discrepancy lies in the different standards of acceptance, and the effect of even seemingly minor alterations can be illustrated by the fall in rejections for the army that has followed changes in the last few years Up to 1936 recruits had to reach a definite standard of height, weight, chest-measurement, vision and dental condition, and to be free from certain minor physical defects, they had, in short, to be practically 100 per cent healthy in all respects On these standards, in the year 1935–36, 18 8 per cent of would-be recruits were rejected by army recruiters on educational or gross physical grounds without seeing the medical officer, and another 21 8 per cent on the medical examination In 1936 instructions were issued that recruits should not be rejected for minor physical defects that would not interfere with their duties, and since 1937 they have not been rejected on dental grounds In consequence the number of rejections by recruiters fell to 3 8 per cent and by the medical officers to 14 per cent in 1937–38 There are certain fallacies which make even these figures larger than they should be Some units have special requirements—for example the Guards, the gunners of the Royal Artillery, and the drivers of the Royal Engineers—and if a man applies for enlistment in one of these he may be rejected on medical grounds although he would be accepted for other units Further, an uncertain number of men who are rejected at one recruiting centre try their luck at others, so that they appear several times in the list of rejections

Taking the figures for last year, the total rejections for the army are only some 10 per cent greater than for the two active-service grades of the militia This difference might partly lie in the sources from which the recruits are drawn The militia are an almost entirely unselected sample of our men of 20 and 21 A large proportion come from comfortable homes and have been well fed during their adolescence Most recruits for the regular army have not had such advantages Many come from the homes of the unemployed and some have themselves been out of work for several years The importance of this factor has been demonstrated by the number of rejected recruits who have been raised to the required standard of weight, chest-measurement and even height at the two recruits' physical development depots In spite of the changes in the army requirements in the last few years, however, they are still sufficiently more exacting than those of the militia to account for a higher rate of rejections The army examination aims at determining whether a candidate is fit for the unit he applies to join, the militia examination whether he is fit to be a soldier at all There is, for example, no specified minimum of height, weight and chest-measurement for the militia, and some of the men with minor defects of feet or vision who are placed in grade 2 (a) of the militia would be rejected for the army. Thus those who draw conclusions as to improvements in the national physique by comparing the figures for the militia with those of the army, and especially those of the army several years ago, are deceiving themselves No one will deny that the health of our young men has turned out to be much better than expected, but we must look elsewhere for proof that it is much better than it was

AN ALTERNATIVE ROUTE

M. & B. 693 is twenty times less soluble in water than is sulphanilamide; for this reason it is absorbed more slowly and less completely from the alimentary tract. Actually the rate and degree of this absorption vary from patient to patient in a way which cannot yet be explained. These considerations, and the fact that coma or vomiting may render it difficult or futile to give the drug by mouth, make it desirable to find if possible some other method of administration by which an adequate concentration in the blood can be attained speedily and surely. The answer is the sodium salt, known here as M. & B. 693 Soluble, and more descriptively in the U S A as sodium sulfapyridine. Although several passing references to this compound have appeared in recent papers, the first full description of its use and action is contained in three papers which we publish this week and in another by MARSHALL and LONG [1] whose studies at Baltimore are evidently independent of the work going on in England and indeed have been conducted on different lines.

These authors, having satisfied themselves by a variety of toxicity tests in dogs and rabbits that the drug had a good expectation of proving safe, decided to give it to patients intravenously, taking the view that since a solution of sodium sulfapyridine is strongly alkaline this is the "only possible route" for injection. The solution used had a strength of 5 per cent. which is nearly isotonic and a pH of 10·7; the dose recommended is 0·06 g per kg. of body-weight and it is emphasised that the injection should be made at the rate of not more than 5 c cm. per minute. Studies of the subsequent concentrations in the blood suggest that diffusion into the tissues is nearly complete within ten minutes; the blood concentration is well maintained, scarcely falling at all during the first hour and to a varying extent, averaging a diminution to about two-thirds of the original maximum, in four hours Ten cases of pneumonia undergoing this treatment are briefly described, serving simply to show that it is feasible and apparently effective. The indications for the parenteral route are three incapacity to take sulfapyridine by the mouth, failure to attain an adequate blood concentration after administration by the mouth, and necessity for obtaining maximum effect as rapidly as possible. In severe cases it is evidently well to begin with an intravenous injection, thereby bringing the full action of the drug to bear within a few minutes, and to rely on oral administration for maintaining it. MARSHALL and LONG found it was rarely necessary to give more than two intravenous injections; sometimes even one might be enough. They have given sodium sulfapyridine intravenously to thirty patients in all, and observed no ill effects except that the injection sometimes caused vomiting. This vomiting, which occurred also in dogs, is of minor importance since it occasions no loss of the drug; it is of interest because it calls in question the current belief that the nausea and vomiting produced by oral administration are due to local action on the gastric mucosa.

Turning to the clinical trials in this country, Dr. CABLE records the successful treatment of a case of pneumococcal meningitis, while Drs COOPER and LEATHES were able to control pneumonia in a patient with a bleeding peptic ulcer—an exceptional (but strong) contra-indication to oral therapy. In both these cases the intramuscular route was used, and this was also the method adopted by Dr. GAISFORD and his colleagues in treating a considerable series of cases, 38 of which are briefly described A 33⅓ per cent. solution was used, 1 g. being therefore contained in the conveniently small volume of 3 c cm.; this is injected deeply into the gluteal muscles, where it causes little pain but may produce necrosis and abscess formation if any of the solution escapes into the subcutaneous tissues. The dose was repeated several times at intervals of four hours even in patients whose treatment was to be continued by the oral route GAISFORD and his colleagues have studied the rise in blood concentration during this form of treatment: the levels attained varied considerably, and the advantage of the intramuscular route appears to be rather the certainty of reaching an adequate (though often only moderate) concentration in the blood than rapidity in reaching it. They also tried the intravenous injection of diluted solution, but gave it up owing to the vomiting produced.

The direct conflict of opinion about the best route of administration seems to be a matter of balancing discomfort and disturbance—possibly to be mitigated by varying the intravenous technique—against the advantages of much more rapid effect and of fewer injections This form of treatment is evidently a useful advance and free from serious dangers, on the other hand it demands skill in the use of a needle and judgment in deciding when and how best to use it.

BOARDING-OUT

SCOTLAND has long been admired for the system there employed of boarding-out insane and defective persons in private families. During eighty years much experience has been gained so that the system works on the whole smoothly and effectively.[1] It is however emphasised in the twenty-fifth annual report of the General Board of Control for Scotland [2] that the selection of suitable cases, and to some extent of suitable guardians, requires close inquiry and local knowledge The public-assistance officer and district medical officer are immediately concerned in this, though the visits of a deputy commissioner of the board provide not only statutory inspection but the specialised and central supervision found by experience to be necessary for keeping up a general high standard of family care in widely varying districts and

1 Marshall E R, and Long, Perrin H, *J. Amer med Ass* April 29, 1939, p 1671

1 Stone, J A, and Evans, A E, *J ment Sci* 1938, 84, 351
2 Edinburgh H.M Stationery Office 1939 Pp 46 1s 6d

circumstances Defectives are apparently a more difficult problem than those sometimes bluntly described in the report as pauper lunatics The boarding of insane patients, it is said, does not provide the same difficulties as occur in the case of defectives In the case of the former, the majority suffer from some degree of dementia and are quiet, contented and well behaved The report remarks on the number of extremely disordered patients with paranoid tendencies who were apparently leading quiet peaceful lives in comfortable homes Many of the defectives boarded in urban areas presented a social or moral problem, often it had been the reluctance of the relatives to hand over a defective to the care of strangers which led to the patient remaining a slum dweller with nothing to occupy him but aimless wandering or standing at the street corner The defective placed under the care of well chosen guardians on a small farm or croft was much happier, sharing in the work and family life of those among whom he lived The high-grade defective has been found to be unsatisfactorily dealt with so long as there is inadequate provision of certified institutions and special schools, and where these defectives are under domiciliary care there is great need for them to have some communal interest and activity It is made clear in the report that many of the 1032 patients provided for in private houses at the beginning of 1939 had never been in any institution and that the term boarded-out is only loosely applicable The whole question of family care, as an alternative to institutional care, needs more attention in England than it has received The lessening of the financial burden upon the community is only one of its claims to consideration As the report of one of the deputy commissioners in Scotland indicates, it has been coming to the fore in the United States, the survey by H M POLLOCK[3] of the provision available in Europe has no doubt contributed to this awakening of interest, though in one or two states in America boarding out has been practised for a number of years

ANNOTATIONS

MEDICAL EMERGENCY IN CHINA

A FEW weeks ago Dr Harold Balme gave in our columns[1] some account of the effect of two years continuous warfare in China and set out to answer the question, foremost in people's minds here, how far the national medical services of China are in a position to cope with the present emergency The answer is partly given in a book which we review this week on another page Miss Ireda Utley, who has accompanied the armies on several fronts, tells of the inefficiency of the army medical corps and the heroic efforts of the Chinese Red Cross Under the leadership of Dr Robert Lim the Red Cross has organised a fleet of mobile units and is engaged in the intensive training of their personnel The League of Nations has responded to his appeal by the despatch of three commissions to organise effective measures to combat the serious outbreaks of epidemic disease, but what is now urgently needed is a model surgical unit to act as a teaching and reconstructive centre and to set a standard in the repair of injuries resulting from the war It is a hopeful sign of the times that the British Orthopaedic Association is willing to organise one of these centres as a mark of sympathy with the Chinese people, and to equip a teaching unit of 250 beds under the direction of an orthopaedic expert to be entitled "The Robert Jones Emergency Relief Surgeon" Members of the association have themselves generously subscribed a sum of £1100 towards the £3500 that would be immediately required The names appended to the letter on p 99 are sufficient guarantee of the practical wisdom likely to be shown in the disposition of the money Many people must have been deterred from contributing to the relief of suffering in China by the feeling that their quota would be negligible in face of the magnitude of the need But here is a direction in which something effective might be done with moderate means, and we commend the venture to our readers and through them to all who are alive to the welfare of China and what it may mean to posterity

1 *Lancet* April 8 1939 p 836

CANCER RESEARCH IN YORKSHIRE

THE investigations[4] carried out in Leeds under the direction of Prof R D Passey and in Sheffield by Sir Edward and Lady Mellanby and also by Prof H N Green cover a wide field In Sheffield J W Orr and D E Price have studied the induction of primary cancer of the liver by an organic dye—butter yellow This substance produces first a cirrhosis of the liver, and the histological changes taking place during this process are being studied in detail An interesting observation is that another substance—carbon tetrachloride—also produces cirrhosis of the liver, but does not induce liver cancer The changes in the metabolism of liver cells during this process of carcinogenesis have been followed by Orr and L H Strickland An attempt has been made to determine whether carcinogenic substances are formed in a tissue (the skin) subjected to a physical carcinogenic agent (prolonged exposure to ultra-violet light) The skin was finely minced, dried and extracted by fat solvents The extract was then either applied to the skin for a prolonged period or injected subcutaneously No evidence of the presence of a fat soluble substance with carcinogenic properties was obtained Dr Clemmesen of Denmark, who has been working in the Leeds laboratory as a guest, had found in confirmation of previous workers that X radiation of the whole animal impaired an immunity to the transplantation of tumours A similar effect was produced by this procedure on the resistance to the Shope fibroma virus This virus induces in rabbits a transient tumour like proliferation of connective tissue If the virus was injected after a previous treatment with X rays the tumours which developed were larger and persisted longer, but eventually they regressed as they do in normal untreated rabbits The experiments were extended to the Shope papilloma virus This virus when rubbed into the skin produces extensive warty growths which sometimes develop into true malignant growths So far

3 State Hosp Press Utica N Y Family Care of Mental Patients 1936

4 Thirteenth annual report of the Yorkshire Council British Empire Campaign Park Square Leeds

irradiation of the whole animal has not produced effects for this virus analogous to those demonstrable for the fibroma virus

The work of the last few years has brought into prominence the importance of the inherited susceptibility to cancer as an ætiological factor. This aspect of the cancer problem has been studied experimentally by Mrs K S Bonser in inbred strains In agreement with other workers she arrives at the conclusion that there is no evidence of a general susceptibility to cancer for all organs As a rule, if a special susceptibility to cancer exists it is focused on one particular organ and strains of mice which possess such a special tendency to cancer in one organ often show a very decided resistance to cancer in some other organs During the past year two apparently well-authenticated claims had been made concerning the chemotherapy of cancer. It was stated that a simple organic substance (heptaldelyde) was able on injection to produce regression of transplanted and of spontaneous tumours in animals A similar claim had been made for a hydrolysate of heart muscle Both these substances have been examined for their therapeutic effects, but these claims could not be substantiated In Sheffield the Mellanbys have continued their studies on the distribution of the Rous-sarcoma virus after injection into the blood-stream. They find that it disappears from the blood very rapidly, being taken up by the cells of the different organs And this is true not only for fowls, for the connective tissue of which the virus is specifically pathogenic, but also for rabbits for which the virus is not pathogenic Professor Green has continued his investigations on the destructive effect of pyocyaneus toxins on tumour cells This effect is enhanced by combining the injection of toxin with that of an alkaloid (colchicine) which arrests cell division The experiments suggest the possibility that by a combination of such agents a more selective therapeutic effect may be obtainable.

A useful innovation of this report is a synopsis giving in non-technical language a summary of some of the work and its bearing on the problems of human cancer.

URINARY EXTRACTS INHIBITING GASTRIC SECRETION

SOME years ago Farrell and Ivy [1] showed that the inhibition of gastric motility and secretion that follows the ingestion of fats is due to humoral mechanism rather than to nervous or direct action, since inhibition is still produced in a transplanted and denervated gastric pouch when fat is taken by mouth. The humoral agent has been proved not to be a fat or one of the products of digestion of fat but a specific duodenal chalone, which has been called enterogastrone Next Sandweiss, Saltstein and Farbman [2] found that the injection of extracts of pregnancy urine successfully prevents the development of jejunal ulcers in dogs subjected to the Mann-Williamson operation This work has now been extended and such extracts have been shown to have the power to reduce gastric secretion but not motility. The urinary gonadotropic hormone of pregnancy, prolan, has been excluded as the active substance since the urine of normal males and females contain it, and lately Gray, Wieczorowski and Ivy [3] have suggested that enterogastrone consists of two fractions, one affecting motility and the other secretion, and that the active urinary extract is one of these fractions. Until now the enterogastrone extracted from the duodenum has not been used clinically because it always contains protein impurities which lead to the development of refractoriness if therapy is continued Urinary extracts can, however, be prepared free from protein impurities, and furthermore, they are some sixteen times as potent as the duodenal ones. It seems, therefore, that the urine may be a more effective as well as a more convenient source of enterogastrone, and that urinary extracts may have a place in the treatment of hyperacidity and peptic ulcers.

1 Farrell, J I, and Ivy, A C, *Amer J Physiol* 1926, 76, 227
2. Sandweiss, D J, Saltstein, N C, and Farbman, A, *Amer J digest Dis* 1938, 5, 24
3 Gray, J S, Wieczorowski, E, and Ivy, *Science*, May 26, 1939, p 489.

THE LAST THOUSAND FEET

THE summit of Everest apparently lies near the ceiling of man's endeavour from more than one point of view. Not only will he, if he reaches the summit without an oxygen apparatus, be asphyxiated, according to Henderson [1] and a host of others, but Matthews [2] says he will also freeze solid If he escapes these ills, Campbell [3] warns him that he will suffer from heart-failure and liver damage Henderson has tried, as many have done before, to calculate the oxygen requirements of the climbers near the top and to compare them with the oxygen actually available. He fairly assumes that the amount of oxygen that the men can obtain from the air decreases steadily as they rise Unfortunately he then proceeds to use as a basis for his calculation Somervell's statement that he and his companion had to "take 8 or 10 respirations for each step and stop to rest for a minute or two every 20 or 30 yards." This was certainly true in 1924 but things are different now. Greene [4] tells us, for instance, that in 1933 when the climbers were carefully acclimatised they needed only two or three breaths to a step and frequent halts were unnecessary So great an improvement partly invalidates Henderson's argument, though whether it is possible to reach the summit without additional oxygen remains in doubt Henderson dogmatically asserts that the inhalation of oxygen from an open-circuit apparatus is of no value during climbing, because all the oxygen is blown away by the tremendous volume of breathing, but the published statements of several mountaineers are in direct conflict with his opinion. Two types of apparatus were taken to Everest in 1938. Of these Lloyd [5] says that the closed-circuit type favoured by Henderson was unsatisfactory for reasons which are not yet clear It is obvious that were it possible to produce a light and efficient apparatus of the kind used for rescue work in mines its wearer could climb on Everest as fast as at sea-level But the problem is not easy, for no tests can adequately simulate conditions on the mountain, where repairs and adjustments to a complicated apparatus are nearly impossible. The other type taken was the simple open-circuit apparatus familiar to physiologists for many years, a development of which was described by Greene [6] in 1934 In this model a corrugated rubber tube was substituted for the more easily damaged canvas bag, and an alternative mouthpiece was provided in the form either of a mask or a tube to be gripped between the teeth In the 1938 expedition

1. Henderson, Y, *Nature, Lond* June 3, 1939, p 921
2 Matthews, B H C, *J Physiol* 1932, 77, 28
3 Campbell, J A, see *Brit J Exp Path* 1935, 16, 39
4 Greene, R, *Everest* 1933, London, p 261.
5 Lloyd, P, *Nature, Lond* June 10, 1939, p 961
6 Greene, *Lancet*, 1934, 2, 1122.

an earlier and rather heavier model was chosen, the extra weight (allowing 1000 litres of oxygen) being nearly 3 lb It was calculated that when set to deliver 2 litres of oxygen per minute, it would "bring the climber down" from 20,000 ft to 20,800 ft, at which height the acclimatised man can climb at almost alpine speed In tests at a height of about 23,000–26,000 ft Lloyd [8] found that the open apparatus proved its value, not only in increasing the speed of climbing, but in lessening strain and fatigue Above 26,000 ft the increase in climbing speed became more and more apparent, especially on easy ground These results seem definitely to negative Henderson's conclusions, and unless the design of closed circuit apparatus can be radically improved the next expedition to Mount Everest would be well advised to depend on the open circuit inhaler

ASSAY OF ŒSTROGENS IN PREGNANCY

WHY œstrogen should be excreted during pregnancy we do not know, some day perhaps we shall find out In the meantime one of the things which may usefully be done is to measure the excretion in a number of individuals so as to define its limits and possibly to correlate its variations with pathological conditions The œstrone and œstriol in the human urine of pregnancy are free only to a small extent For the most part they exist in combination with inert substances in forms which are relatively, but not completely, inactive when assayed by their ability, on subcutaneous injection, to bring a spayed test animal into œstrus In the present state of doubt as to what is significant, the obvious course is to measure the amounts of free and inactivated œstrogen separately The latter may be released from combination by acid hydrolysis, and it then appears in such quantities as to be worth subdividing into œstrone and œstriol fractions In 1935 Cohen, Marrian and Watson [1] published curves showing the average urinary excretion of free and combined œstrone and œstriol for different periods of pregnancy in a number of women, thereby establishing a general rule The latest investigation of this kind is that of Dr Hain [2] of Edinburgh, who has made assays in 47 women during the latter half of pregnancy, recording not only the average findings but the individual assays in each case In many instances several assays at monthly intervals have been made on the same person This laborious work has disclosed great individual variations in the amount and behaviour of the urinary œstrogen, so great as to cast suspicion on attempts to associate diminished or increased excretion with types of abnormal pregnancy Apart from establishing a kind of prophylaxis against such premature correlations, it is doubtful if the research has added to the sum of theoretical knowledge *But this, as already suggested,* was hardly to be expected and in no way reflects upon the quality of the work or the necessity for doing it We emphasise this, because we believe that in certain particulars its presentation is open to criticism

In the table of results, for instance, the concentrations of combined and free œstrogen and the two fractions of the former are all expressed in milligrammes per litre Yet the sum of the quantities of œstrone and œstriol far exceeds the quantity of combined œstrogen of which they are the component parts This is manifestly impossible, and, although the explanation for the discrepancy can be guessed by studying the body of the paper, it is by no means obvious and in any event would probably be quite incomprehensible to those unfamiliar with the technicalities involved In mice, which were the test animals, œstriol has a different order of activity from that of œstrone when assayed by Dr Hain's method. Consequently, the increased œstrogenic activity of urine on hydrolysis is chiefly due to the œstrone liberated, the liberated œstriol, though many times greater in amount, having little effect on the assay The "milligrammes" of combined œstrogen in Dr Hain's table refer not to the actual collective weight of this group of substances, but to an equivalent and much smaller weight of standard œstrone against which its activity has been checked This value is therefore of the same order as the weight of the urinary œstrone after separation, which, within the limits of error of biological assay, is given in real milligrammes The separated œstriol, the assay of which is checked against a sample of pure œstriol, is also given, with the same reservation, in real milligrammes, but owing to the relative inactivity of œstriol the amount is large It is a pity that Dr Hain did not make this clear in her table of results, for this table is valuable and likely to be used for reference Confusion is not lessened by phrases in the text such as "œstrone, i.e., combined œstran," which implies (erroneously) chemical identity when quantitative similarity of activity is meant Control experiments, which seem to have been conscientiously carried out, deal with various difficulties—such as the separation of œstrone and œstriol without destroying the former, the optimal time for hydrolysis—points whose bearing on the results are readily appreciated. It is however not clear whether or not the slight œstrogenic activity of combined œstrogen before hydrolysis—possibly important when large amounts are present—is included in the preliminary assay of "free" œstrogen While the concentration of androgen in the urine is found to be less than that of the non pregnant woman, it seems to show no progressive change with the advance of pregnancy

The individual irregularities in the concentrations of excreted hormones raise the question whether the straightforward analysis of urine will prove to be of any more diagnostic value than (say) the simple estimation of urea It may be that the problem with which the kidney is dealing at any moment will also have to be elucidated If a guess had to be made, it would be that the final clinical criterion will be something in the nature of a renal or hepatic function test, in which the body is given a measured task to perform As Dr Hain points out knowledge of the metabolism of these hormones is in its infancy, so that a rational basis for such a test does not yet exist

PHARMACOGNOSY

THE Hanbury medal has been awarded to Mr T F Wallis, reader in pharmacognosy in the University of London The occasions on which the award committee (composed of the presidents for the time being of the Linnean, Chemical and Pharmaceutical Societies, and the chairman of the British Pharmaceutical Conference) has conferred this honour on a British pharmacist have been sufficiently infrequent to make the present choice outstanding This medal, a memorial to Daniel Hanbury, F R S (1825–75), is given for high excellence in the prosecution or promotion of original research in the natural history and chemistry of drugs the first recipient was Flückiger in 1881 The sum of the work done by Mr Wallis, chiefly in the Pharmaceutical Society's research laboratories during the past

1 Cohen S L., Marrian G F., Watson M. *Lancet* 1935, 1 674
2 Hain A M., *Quart J exp Physiol* 1939, 29 139

39 years. has been (1) to discover those details of gross morphology and of microscopical structure by which it is possible to identify correctly vegetable materials used in medicines either in the entire condition or in the form of powder, (2) to provide characters by which adulterants can be detected in foods and drugs, especially when in the powdered form or in broken pieces, (3) to discover general methods by which the proportions by weight of powdered materials —drugs or foods—may be accurately determined by means of the microscope, (4) to devise new optical apparatus and mechanical contrivances for use with the microscope in the study of powdered drugs, and (5) to devise new methods for the determination of the purity of certain chemical substances used in medicine and pharmacy. The results achieved by Mr. Wallis are recorded in thirty-seven papers describing original work which has made it much easier to maintain an efficient control over the purity and quality of food and drugs.

THE ILLEGITIMATE CHILD

TWENTY-ONE years ago the outlook of the infant born out of wedlock was precarious indeed: "The life of the unwanted baby is terribly easily snuffed out with his first sunset," wrote the editor of *Maternity and Child Welfare* in 1918. This wastage of life was not due to any inherent delicacy, but to the deplorable social and economic conditions which the child inevitably had to face, and the fact that the infant death-rate was at least twice as high among illegitimate babies as among the legitimate did not lie at all heavily on the public conscience But the losses inflicted by the war began to lead people to think that all young life, however lowly, was worthy of preservation, and those whose efforts to promote child welfare had hitherto met with indifference became all at once recognised as benefactors At about that time a conference held at the Mansion House led to the formation of the National Council for the Unmarried Mother and her Child Mrs H A L. Fisher, who became chairman of the council, has served in that capacity ever since, and has written a booklet entitled "Twenty-one Years" [1] to mark its coming-of-age, which was celebrated at the annual meeting held on June 13 at the Drapers' Hall.

At first the council encountered a great deal of prejudice and opposition; it seems strange to find that in 1918 nursing associations and maternity societies were only beginning to relax the rule that their nurses might not attend the birth of an illegitimate child Many people then still honestly believed that measures for the benefit of the unmarried mother were a challenge to the accepted standards of morality, and the education of public opinion, to promote which the council set itself, was an uphill task Gradually, however, sympathy was enlisted, and the fact rammed home that, whoever else was to blame, the child was innocent and deserving of help. The council soon found itself with an immense volume of work, and Mrs Fisher says. "Our story has been one of continuous overwork, brilliantly achieved, on the part of a staff which has never had enough room, enough money or enough help, but which nevertheless has made the council's life its own." The law bore no less hardly on the illegitimate child than did the actions of well-meaning but misguided moralists, and credit is due to the council for its untiring and fruitful efforts to secure reform of the bastardy laws Since its inception the legal position of the unmarried mother and her child has improved in many directions—for example, in the increased amount payable under an affiliation order, in the legitimisation of the child by subsequent marriage of the parents, and in the declaration of legal kinship between a mother and her illegitimate child in cases of intestacy. In all these reforms the influence of the council has made itself felt The council believes that it is almost always desirable to keep mother and child together where possible, and regards the solution by adoption as a good deal less than the best It has worked hard to promote the establishment of really good homes and hostels, and is in close touch both with Government departments and with other national and religious organisations Perhaps most important of all it conducts its work in strict confidence and with unsentimental sympathy

1. Obtainable from the National Council for the Unmarried Mother and her Child, 117, Piccadilly, W 1

THE ROYAL COLLEGE OF NURSING

THE King's command that the College of Nursing shall henceforth be known as the Royal College of Nursing is timely, for we are beginning to realise that we are perhaps taking our nurses too much for granted and that the material return we offer them for their services is not commensurate with the gratitude we all feel. The college which was founded in 1916 to provide a central organisation for trained nurses was granted a royal charter in 1928 It has today a membership of some 30,000 trained nurses and a student-nurses' association of nearly 8000 nurses in training. The college has always recognised the importance to the community of an expert nursing service, adequate in numbers, quality and training to tend the sick and to safeguard the health of the public, and it has worked to improve the conditions in the profession and to attract the best kind of recruit. Our troubled times have added to its duties during the last year. Acting on behalf of the medical officer of health of the London County Council it is now responsible for the distribution of nursing personnel to the various sectors in which the hospitals in the London area have been grouped under the emergency hospital scheme, while in Scotland it is entirely responsible, under the Central Emergency Committee, for the recruitment and organisation of trained nurses to the civil nursing reserve

Medical men and women who have special opportunities for appraising the worth and work of nurses will recognise the fittingness of the new title.

CHEST LEADS IN CARDIOGRAPHY

THE physiological variations in the form of the curves obtained with a precordial exploring electrode are gradually being worked out in normal people, and comparison of these with the large number of tracings taken in cardiac lesions is clarifying the meaning of changes in these leads The subject is a complex one because, unlike curves obtained with limb leads, a small shift in the position of the electrode applied to the precordium may produce a big alteration in the form of the curve In order to assess the significance of a curve the exact position of the exploring electrode on the chest wall—especially its relation to the cardiac apex—and the range of normal variations obtained at this area, must be known Chest leads have been of greatest service in the diagnosis of cardiac infarction, though they may help in other lesions As with limb leads alterations in the direction and form of the T wave and deviations of the RS–T segment are important, but in the precordial lead special value is also attached to changes in the

orm of the mitral ventricular deflections or QRS omplex If a single precordial position only is used he area over the cardiac apex is generally considered he most reliable of all, and Robinson, Contratto and evine[1] find that absence of the R wave in the apical ead is almost invariable in the anterior type of ardiac infarction but rare in the normal heart and n other cardiac lesions They think that a small wave of less than 2 mm is questionable evidence f infarction They show that with only a small hift of the electrode medially from the apex the wave may diminish in amplitude considerably ow amplitude or even absence of R is found in ascites and left pleural effusion, the wave increasing r reappearing when the fluid is aspirated Inversion f the T wave in the apical lead is less constant and nore transient in anterior infarction, and is also ften present in cardiac lesions other than infarction —for example, mitral stenosis, high blood pressure nd syphilitic aortitis Even when the heart is quite ormal an inverted T is occasionally found in the pical lead In posterior cardiac infarction the pical lead gives no evidence not provided by traings with the ordinary limb leads Very similar conclusions re reached by Vander Veer and Edwards[2] after a tudy of 102 cases showing absent or small R wave n the apical lead. They found anterior cardiac nfarction in 67 cases when this wave was absent, he remainder being ascribed to luetic aortitis, oronary disease and possibly cardiac enlargement They agree with Robinson and his colleagues that disappearance of R is a change of long duration and hat it rarely returns to normal, the T wave changes being, on the contrary, of much shorter duration, but they regard inversion of T in lead 1 and in the pical lead as increasing the significance of a small or absent R wave in the apical lead

BIOPSY OF THE CERVIX

CARCINOMA of the uterine cervix, like that of other tissues, passes through an early almost symptomless phase before bleeding and discharge demand relatively late investigation By this time the growth may have become so extensive as severely to reduce the chances of cure Assuming that the two available therapeutic weapons, surgery and radium, have been exploited nearly to their limit, results can only be improved by earlier diagnosis The cervix is in many ways an ideal organ for this purpose it is readily accessible to inspection and palpation, and its relative insensibility to cutting and cauterisation allows a histological biopsy to be undertaken without admission to hospital and without an anæsthetic Wollner[3] of New York and Phaneuf and Belson[4] of Boston have independently drawn attention to the remarkable number of unsuspected carcinomas of the cervix that routine biopsy will reveal—in 59 examinations Wollner found 2 and in 100 Phaneuf and Belson found 10 Wollner recommends the removal of the lower half of the cervical mucosa to the point where it joins the healthy squamous epithelium of the portio vaginalis, and he uses a diathermy cutting loop Phaneuf and Belson use a sharp knife cauterising the incised area with caustic or electricity, a procedure that they say will also clear up nearly all cases of simple chronic cervicitis Biopsy, a method which is only suited to the specialist, cannot take the place of the ordinary pelvic examination, but it can be of great value in differentiating between early carcinoma and chronic inflammation in suspicious areas found with the vaginal speculum Wollner urges that every woman over 30 should have at least one routine tissue examination of the lower third of the cervix, and though this suggestion is likely to remain an unfulfilled ideal, it is no doubt a possible way of securing earlier treatment

1 Robinson R W Contratto S W and Levine S A., *Arch Intern Med* April 1939 pp 711 and 722
2 Vander Veer J B and Edwards J C *Amer J med Sci* May 1939, p 667
3 Wollner A, *Surg Gynec Obstet* Feb 1, 1939, p 147
4 Phaneuf L E and Belson M O *New Engl J Med* May 25 1939 p 21

A NEW DIRECTOR-GENERAL

WITH a view to further strengthening and coördinating the emergency medical services, the Minister of Health and the Lord Privy Seal have appointed Dr J H Hebb, C B , director general of medical services in the Ministry of Pensions, who is already acting as a principal medical officer in the Ministry of Health to take charge, as director general of emergency medical services both in the Ministry and in the Air-Raid Precautions Department of the Home Office

Dr Hebb will be assisted by a deputy, Lieut.-Colonel E T Potts, C M G , M D , who will act as headquarters officer in relation to medical personnel, assisted as regards nurses by Miss Watt, C B E , late matron in chief of the R.A.F , who will also be associated with the Central Emergency Committee of Nursing, the body responsible for building up the Civil Nursing Reserve Colonel Potts has had wide organising and administrative experience as assistant director of medical services at the headquarters of the British troops in France and Flanders in 1919 and 1920, and as assistant director of medical services, General Headquarters of the Army in India, from 1928 to 1933

Additional hospital officers have also been appointed Dr P H Oakley (headquarters) Colonel T H Scott and Wing Commander A J Brown (London region), Dr A E Tudor Hart (midland region), Lieut Colonel C L Dunn (north-western region), and Colonel H T Bates (north eastern region)

Lord HARLECH has been elected chairman of the board of management of the London School of Hygiene and Tropical Medicine He has also become a member of the court of governors of the school

At the annual meeting of the Coroners' Society of England and Wales held on June 29, Dr H BRETHER JACKSON, coroner for Croydon, was appointed president for the coming year Dr Jackson, who is also a solicitor, carries on a family tradition for his father was also Croydon coroner He conducted the inquest in the famous and lengthy "arsenic case" which attracted much attention a few years ago The society lost its secretary, Dr F Danford Thomas, this year, and he has been succeeded by Dr W Bentley Purchase, the North London coroner, with the never ageing Sir Walter Schröder as assistant secretary Both these officers have actually been in charge since Dr Thomas's death a few weeks ago

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SEND OFF DINNER FOR MEDICAL WOMEN.—Miss Hilary Long and Miss Doris Brown whose appointment to the Women's Medical Service for India was announced in our issue of June 17, were the guests of honour at a dinner given by the Yorkshire Association of Medical Women on June 26, at which Prof. J R Flint and Prof Matthew Stewart spoke Miss Long is to be professor of surgery at the Lady Hardinge Medical College New Delhi, and Miss Brown is joining the gynæcological unit at the college

SPECIAL ARTICLES

WHAT MEDICINE OWES TO GREEK CULTURE

It was Sir Henry Lunn's achievement to enable the English-speaking peoples to take a less parochial and insular view of peoples of other lands On the occasion of his golden wedding two years ago Mr. H A. L. Fisher spoke of Lunn as an educator and a missionary You have, he said, rendered a very great service to higher education in this country by enabling so many students of Greek letters to visit the sunlit shores of the Ægean As chairman of the Hellenic Travellers' Club, Lunn had arranged in the early spring of this year a cruise to the highlands and islands of Greece, including visits to Epidaurus and Cos, giving opportunity for the study of the art of healing as it arose there His fatal illness on the preceding cruise prevented him from personally conducting this party, which consisted largely of doctors and their families, and from presiding at a series of lectures by medical men who had made a study of various aspects of Greek culture. Prof. J. A. Nixon (Bristol) discoursed with illustrative material on Greek athletics; Prof G E. Gask described the cult of Æsculapius and staged a scene from Aristophanes to make it topical; Dr. J. Dixon Comrie (Edinburgh) gave the fruits of a lifelong study of the Father of Medicine; and Sir Walter Langdon-Brown completed the series with a more general study of Greek influence in medicine. The lectures will appear in the Yearbook (1939) of the Hellenic Travellers' Club by whose courtesy we are able to reproduce here the substance of the discourses, along with some pictures collected for the most part on the cruise.

A B

(A) Statue of Æsculapius, god of healing, in the National Museum at Athens

(B) Statue of Telesphorus, god of convalescence, in the National Museum at Athens It was Telesphorus who gave Aristides the healing balsam at Pergamos The hooded figure with closed lips suggests the silence and secrecy to be observed by the physician.

The Cult of Æsculapius

(PROFESSOR GASK)

Æsculapius, the mythical god of healing, was taught that art by Cheiron, the centaur, and had two sons, Podalirius and Machaon, who fought at Troy and are the supporters of the coat of arms of the Royal College of Surgeons His cult spread over Greece and the islands as far as Asia Minor and Rome. Hundreds of temples, called æsculapia, were erected to him (often in association with Hygeia and Panacea), the most important being at Epidaurus, Athens, Cos and Cnidos The chief item in the ritual was incubation —i.e, the patients slept in the temple to have healing dreams. This was done after purification and sacrifices. During the incubation harmless sacred snakes crawled among the patients and licked their sores The importance of these snakes is shown by what happened during the plague in Rome in 292 B C. After consultation with the Sibylline books an embassy was sent to Epidaurus for help and brought back one of the snakes. As they were sailing up the Tiber, the snake slipped overboard and swam to what is now the island of San Bartolomeo This was regarded as a sign that a temple to Æsculapius should be built there, and the island was given the form of a trireme to commemorate the voyage When the river is low, remains of the ancient stones can still be seen, together with what probably is a representation of Æsculapius There is still a hospital on this island and tradition says that here, about A D 1120, Rahere lay sick with a fever and dreamt that he would be cured if he built a hospital on his return to London So one may amuse oneself by thinking that there is a connexion between St Bartholomew's Hospital in Smithfield and the old healing gods of Greece

Common Seal of the Royal College of Surgeons of England. Supporting the armorial bearings are the two sons of Æsculapius: Machaon holding a broken arrow and Podalirius with a staff entwined by a serpent.

Though the cult had such a vogue, the subtle minded Greeks could laugh at it, and it was the subject of one of Aristophanes's comedies the "Plutus," which is thought by scholars to give a good description of what went on in a temple of Æsculapius The next reliable information comes from the "Sacred Orations" of Aristides in the second century A.D., when, in addition to the previous ritual, the treatment included dieting, bathing and exercise. Aristides was given prescriptions, such as balsam, to be used on leaving a hot bath for a cold one; on a cold frosty night he had to rub himself with mud, run three times round the temple, and wash himself in the well. There is no evidence that any serious medicine was practised at these temples, and some of the old paganism became attached to the Christian religion.

Photo G. H. Ward.

The abaton or sleeping place in the æsculapium at Pergamos. The row of broken marble columns once supported the roof, the spaces between them leaving the patients open to the distant view and to the visit of the healing snake

Thus St Cosmas and St Damian were reputed to have miraculous healing powers, and incubation was practised at their shrines, at certain seasons crowds of sick still frequent the church at Ayassos on the island of Mytilene, sleeping in the church or its courtyard

The island of Cos, the birthplace of Hippocrates, is the site of a very famous æsculapium, and it is believed by many that Hippocrates received his training and derived his inspiration from it—a belief that is probably incorrect, for there is no taint of magic or superstition in his teaching. Further, all the available archæological evidence suggests that the æsculapium at Cos was *not* established until after Hippocrates's death

Hippocrates

(DR COMRIE)

Hippocrates is said to have been born in Cos in the year 460 B.C., the son of a physician named Heraeloides. He was trained in medicine first by his father in Cos and later in Athens where he spent most of his life in the practice and teaching of medicine. Nevertheless he travelled much and visited Thessaly, Thrace, Macedonia and possibly Scythia. On one of these journeys he died at Larissa, in Thessaly, probably about 375 B.C. at the age of 85.

The Hippocratic writings, on which the fame of Hippocrates rests, consist of about seventy works dealing with very different topics, theoretical and practical. Some give clear cut pictures of disease with the appropriate treatment, others are mere notes intended perhaps as headings for a course of lectures. Some are perfectly simple and easy to follow, others are confused and barely intelligible. All are in the Ionian dialect, but internal evidence shows that they were composed by different writers at different periods. Among them, however, stand out about a dozen which bear the stamp of genius, these indicate an author with great power of observation, clarity and simplicity of exposition, they have been recognised by authorities as the genuine works of one man, who is assumed to have been Hippocrates. Those treatises, regarded as the genuine work of Hippocrates and translated by Francis Adams for the Sydenham Society in 1849, include "On Ancient Medicine," "On Airs, Waters, and Places," "On the Prognostics," "On Treatment in Acute Diseases," "The Epidemics" (books I and III), "On Injuries of the Head," "On Surgery," "On Fractures," "On the Joints," "On Setting Joints by Leverage," "The Aphorisms," "The Oath," "The Law," "On Ulcers," "On Fistulæ," "On Hæmorrhoids," and "On the Sacred Disease" (epilepsy). It has been suggested by W. H. S. Jones that the whole collection of "Hippocratic writings" formed the library of the Hippocratic school of medicine at Cos. These works have passed through the hands of a host of commentators, of whom the greatest was Galen (second century A.D.). The earliest commentary that has survived (as a tenth-century MS.) is that of Apollonius of Citium (*circ.* 100 B.C.). The earliest MS. of Hippocrates now extant is a ninth century codex of the Laurentian library.

The fundamental principle of Hippocratic treatment was that the cure must be effected by nature, and that the best the physician could do was to see that nature got a chance and to assist the natural cure. The remedies were chiefly purgatives and febrifuges, 236 plants are mentioned in the Hippocratic writings. Great emphasis was laid on prognosis ("in this way you will justly win respect and be an able physician"). The importance of Hippocrates is that he first separated rational medicine, as practised by the members of the Asclepiad guilds, from temple medicine, conducted by the priests. The critical Athenian mind had already begun to see through the impostures of the priests, as shown by

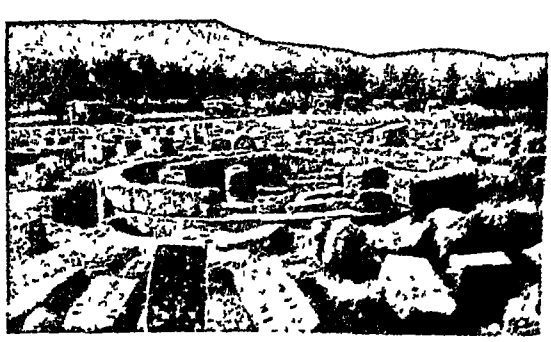


Photo G. H. Ward.

The tholos, close to the æsculapium at Epidaurus, where the sacred snakes were kept. It is arranged in concentric circles, the outside one 37 in diameter, and is 12 ft. deep. Note the seat for the attendant

Aristophanes in his "Plutus." Hippocrates insisted on the complete banishment of superstition and on the rational treatment of all diseases instead of by ablutions and incantations, as if they were inflicted by the gods This attitude is clearly defined in his treatise on epilepsy: "It is not any more divine or more sacred than other diseases but has a natural cause, and its supposed divine origin is due to men's inexperience and to their wonder at its peculiar character."

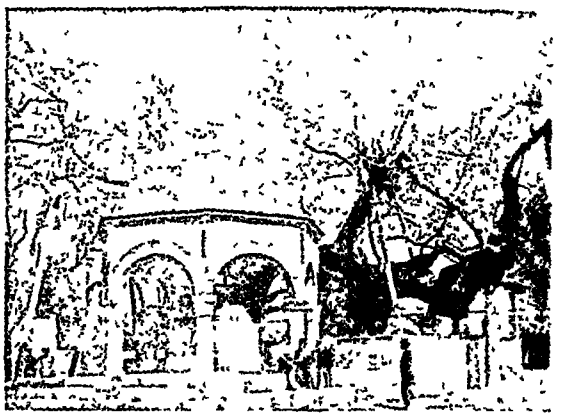
Greek Athletics

(PROFESSOR NIXON)

In no country have athletic sports attained the same degree of national importance as in Ancient Greece The games festivals, although not consciously instituted for such purposes, soon came to serve two great objects: first, they promoted physical fitness and dexterity in martial exercise, secondly, they led to frequent assemblies of the inhabitants of all the states of Greece, thus favouring national unity. Even states at war with one another suspended hostile operations during the games. Competitors and spectators could travel safely to the festivals, and no warlike weapons were allowed to be brought into the sacred precincts The great athletic celebrations, such as the Olympic games, must have developed slowly from the funeral games, such as those described by Homer as having been held in honour of Patroclus, at which all the contestants were given prizes as memorials of the dead. In later times all competitors at Olympia underwent thirty days' training at Elis under the supervision of the Hellanodicæ, who themselves underwent ten months' training in their duties. The training was severe, absolute obedience being enforced, when necessary, with the rod. The Hellanodicæ tested the athletes, rejected the unfit, and graded the entrants in age-groups, after satisfying themselves of their parentage and claims to compete The earliest extant records of the games concern the 28th olympiad of 776 B.C. (each olympiad being a period of four years).

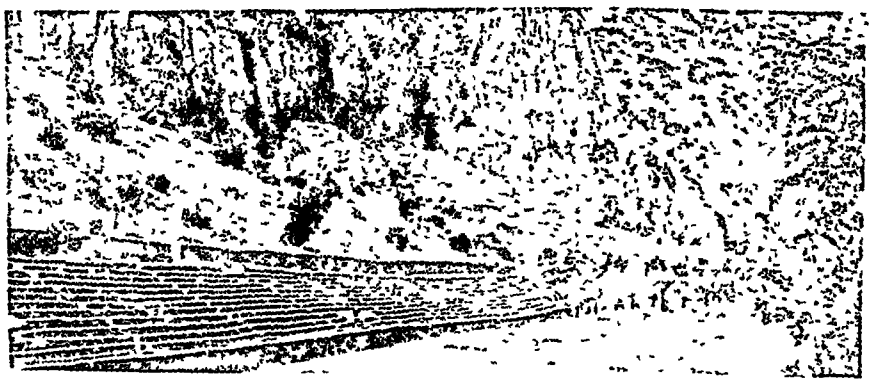
Down to the end of the sixth century B.C. the athletes were amateurs and the Greeks were truly a nation of athletes Their training was natural, elaborate rules for exercise, diet and sleep not yet having been introduced. But the typical athlete of the sixth century was the strong man—boxer, wrestler, or pancratiast In the fifth century B.C specialisation had not yet begun; the best athlete was an "all-rounder," and artists and sculptors set up a standard of physical beauty. Style and grace in athletics were more admired than mere strength. This love of beauty checked the growth of specialisation and the encroachment of professionalism But specialism came in with the advent of professional trainers. Athletes were selected and trained for particular events The new training concentrated on particular exercises calculated to develop limited groups of muscles, with the result that in the statues and drawings of these later athletes different physical types can be recognised as adapted for different sports From the professional trainer it was but a short step to the professional athlete, and with his arrival amateurs retired from the competitions Training for athletics ceased to be a useful training for war, and complaints to this effect were heard: Epaminondas declared in the fourth century that fleshy boxers and pancratiasts were of no use as soldiers and dismissed them from his army; Philopoemen, two centuries later, refused to cultivate his natural gift of wrestling, saying "better wrestler, worse soldier"; and Galen, in the first century A.D., although he thought highly of bodily exercises, opposed athletic training, saying that the health of athletes was most deceptive and precarious and their strength of no use for practical purposes At the time of the Peloponnesian wars in the fifty century B.C the mass of the people were no longer athletic, although they were eager spectators at the professional competitions Nevertheless the ideal of physical fitness was firmly implanted in the Greek mind, and it was held that the fitness of the body had an important effect on the character and the mind

In modern times there has been a revival of the cult of physical fitness, yet we are not sure what constitutes a state of perfect fitness—still less how we may achieve it. Some seek it through exercise and still more exercise; but the effects of athletic exercises show us that it is not given to everyone to develop skill in games, however much he may practise A more rational spirit is



[Photo G. E. Ward.

The plane-tree in the market-place at Cos under which Hippocrates is said to have sat and seen his patients. It is certainly a very old tree.



[Photo G. E. Ward.

The stadium at Delphi which is 190 paces long and 28 paces across The site was too steep for chariot racing which took place in the valley far below.

entering into the search for physical fitness World wide inquiry is being made into its physiological and psychological foundations Good food and healthy conditions of living are being recognised as no less important than muscular exertion

Greek Influences in Medicine

(SIR WALTER LANGDON BROWN)

The eternal youth of Greek thought, although at times buried for centuries, has at intervals burst forth to the surface like a stream to refresh the deserts of scholasticism and to sweep away outworn traditions If the virtues of the Greek spirit are those of inquiry, moderation, reason and freedom, its vice was that of uncontrolled speculation, as best exemplified in Plato's "Timæus," which gives a complete design for the universe, including an inverted conception of evolution—the descent of animals from man Such teleology undoubtedly hampered the progress of science, since it was eagerly adopted by the authoritarian spirit of the Middle Ages The main stream of Greek thought disappeared underground when Justinian I closed the school of Athens in A D 529 Before this happened, however, Rome had constructed an aqueduct which diverted much of the stream to herself, and in the reign of Marcus Aurelius the famous Galen was the

[From E Norman Gardiner's Greek Athletic Sports and Festivals Macmillan & Co 1910

Pan-athenaic amphora showing four amateur runners reaching the turning point It illustrates the correct (alternate) attitude of limbs as early as the sixth century B C

great exponent of Greek medicine After him all scientific inquiry seemed to pass into outer darkness

Perhaps the seventh century was the darkest of all Such light as still shone was provided by the Arab school In the twelfth century medicine, based on the teaching of Averroes, was by far the chief faculty of the school of Salerno, and for several centuries Salerno stood almost alone in its rational methods and in its conservation of Greek and Latin treatises. Early in the thirteenth century Frederick II, who was keenly interested in science, insisted on the students there, after a preliminary study of logic, dissecting corpses (which he had no difficulty in supplying), combining this with clinical work and the reading of Hippocrates and Galen Students were not granted appointments until they had practised a year beside an experienced physician Unfortunately Frederick's quarrels with the papacy greatly hampered his educational reforms and when he died in 1250 theological fetters were bound more firmly again on the growing mind of the thirteenth century A hopeful dawn ended in the twilight of the Black Death

Thus we approach the second phase of the Middle Ages, in which authority was felt to be necessary for the stability of Europe The spirit of domination spread to science with disastrous results The Dominicans decided to abstain from the study of physical and medical science and are represented on the walls of the Spanish chapel in Florence as the dogs of the Lord (domini canes) trampling on Averroes, the sole link between ancient and modern medicine The only thing that saved medical science during the next two centuries was surgery, which the physicians tried hard to suppress, with the result that medicine lost touch with facts and the physician too proud even to examine his patients, deprived his brain of the subtlest machine in the world—the human hand The stream of Greek thought seemed now not only to be contaminated but also to have become stagnant, yet good came out of evil when the capture of Constantinople by the Turks in 1453 set free far more abundant original Greek literature The new learning was spread by the new invention of printing The Renaissance came to Cambridge in the person of Erasmus, who established there the study of Greek He was accompanied by John Siberch, founder of the first printing press to be set up in Cambridge, who published Thomas Linacre's commentaries on Galen

Thus the Greek tradition was revived by Linacre, the father of academic medicine in England, who also induced Henry VIII to found the Royal College of Physicians of London in 1518 and established lectureships at Oxford and Cambridge in 1520, which stimulated Henry to create regius chairs at those universities in 1540 With such a splendid start it is disappointing to discover how little was achieved This was because the new learning was simply an authoritarian exposition of the old medicine The regius professors merely read the corrected versions of the writings of Hippocrates and Galen, and no attempt at new observations was made Men like Caius and Harvey still had to go to Padua for their medical training It was not until Harvey introduced the new method of experiment that a real change came He had been influenced by Bacon's method of inductive reason, and Bacon in his turn by the physical experiments of William Gilbert, president of the Royal College of Physicians in 1600 Thus observation, reasoning and experiment entered into medicine and replaced mere authority But the clinical application of the method of strict observation was due to Sydenham It is interesting to note the sequence of the new ideas first Gilbert's physics, then Harvey's anatomy and physiology, and then Sydenham's clinical observation—a genealogical tree of medical science which the student of today has to climb in his first, second, and third M B. examinations

Each of these revivals of medicine through the rediscovery of Greek thought was a conscious return, but the modern return to certain features of the Æsculapian cult has been unconscious As early as 500 B C Alcmæon had insisted that "health depends on harmony, disease on discord, of the elements within the body" We are now prepared to regard disease as the sum total of the uncomfortable reactions (dis ease) of a patient to some perturbation in his external or his internal environment—possibly in both Thus an anxiety neurosis and a bacterial infection are equally diseases, but the form of the reaction is largely determined by the make up of the patient In Mohr's words: "There is no such thing as a purely psychic illness or a purely physical one, but only a living event taking place in a living organism" So we find ourselves after twenty-five centuries, standing where Alcmæon stood

Cleanliness, fresh air, analysis of dreams and psychological explanation were the cardinal tenets of the Æsculapian cult, and all of them were lost by medicine until recently. Today we have returned to the cult of Æsculapius and are his faithful disciples.

Watching the ebb and flow of the tides of Greek influence through the centuries provokes a sombre reflection. If the Middle Ages considered truth to be static, we believed liberty of thought and the right of free investigation to have been permanently established. With something of a shock we have had to realise that the price of liberty, even liberty of thought, is eternal vigilance We see cause to dread what H. G. Wells called "the incursion of the clumsy lout" This century may have adopted as a slogan "Propaganda is more powerful than truth," but we must never bow the knee to a Baal that would make natural science into national science.

PARIS

(FROM OUR OWN CORRESPONDENT)

OLD-AGE PENSIONS FOR DOCTORS

When M Pomaret some years ago proposed compulsory retirement at 65 for members of professions, sharp protests were made by lawyers, doctors, and engineers Owing to lack of funds the scheme was dropped; but a new scheme has been planned, again sponsored by M Pomaret, but this time with the collaboration of Dr. Cibrie, secretary of the *Confédération des Syndicats Médicaux Français*, which represents 21,000 doctors out of about 27,000 in France It embraces the whole profession on an insurance basis The premium paid by the doctor would be compulsory during the whole of his time in practice, but the age of retirement would be optional after 65.

The premium would be about 3000 francs a year, with a diminishing reduction during the first years of practice and a progressive reduction after 60 The monthly income, starting at 1000 francs during the first years after the scheme comes into force, would later rise to 2000 francs or more A clause has been inserted to safeguard against possible alterations in the value of money. Only half the annual premiums would be capitalised, the other half being shared each year. Provisions have been made for widows and children

The plan has been accepted by the majority but is criticised sharply by a strong minority, who think that the pensions freely subscribed by ancient professional corporations are better from both the financial and the ethical standpoints. The present plan, which falls in with the social ideas of most politicians, has every chance of being passed by both chambers

NEW LUNACY BILL

The confinement of lunatics is governed in France by a law of 1838 which has never been changed. Since 1870 eleven attempts have been made to modify it, but each time the intended improvements proved to be worse than the old law. A new bill, which has just been passed by the chamber of deputies, keeps nearly all the items of the 1838 law but introduces the principle of voluntary admission and legalises the status of the "free insane hospitals" to which patients are admitted without being certified. The first example of a hospital of that kind, the Hôpital Henri-Rousselle, was founded by Dr. Toulouse shortly after the late war.

A recent decree changing the name of the *asiles d'aliénés* to *hôpitaux psychiatriques* has given much satisfaction to those who have long been trying to get the public to regard insanity as mental disease and not a disorder of conduct

"CARNET SANITAIRE"

M. Rucart, minister of public health, has introduced the use of a book (*carnet sanitaire*) intended to record the medical history of its owner. It is given free by municipal authorities at the birth of a child. At schools and hospitals it is given or sold according to the private means of the person concerned. No name is written on the book but only a number referring to a register held by the distributors, so that, if lost, it can be returned to its owner without breach of confidence. At present the booklet has commended itself more to the sanitarian than to the private practitioner whose interest it was hoped to elicit.

FIRST STAGE OF GASTRIC CANCER

Dr R. A. Gutmann, consulting physician for gastro-enterology in Professor Gosset's surgical clinic at the Salpêtrière, has evolved a method of early diagnosis of cancer of the stomach by a close confrontation of clinical study, therapeutic tests, and radiography. In his recently issued book he publishes cases in which the surgeon at operation could palpate nothing abnormal and hardly anything abnormal could be seen on the open viscus by the naked eye, but microscopy alone proved the diagnosis. Professor Gosset claims in the preface that this work is the first to be published on the initial phases of gastric cancer.

Dr. Eisendrath, of Chicago, has died in Paris, where he had lived since the war. He was consulting urologist at the American Hospital in Paris and much appreciated by the American colony.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

MALNUTRITION

In an address to the tenth annual convention of the New York State Dietetic Association, Dr. Frank G. Boudreau reviewed the evidence of inadequate nutrition in the United States It was found in investigating an outbreak of scurvy in Maine, he said, that half of the 4000 children studied had had no milk for two years The blood ascorbic acid was estimated in 95 children and 66 of them had less than the normal concentration and 44 had less than 0·5 mg per 100 c cm. Of 155 children admitted to the Toronto Hospital for Sick Children, only 16 per cent. had ascorbic-acid levels believed to be consistent with good health

Nutritional œdema, due to deficiency of protein, is found in 15 per cent of patients admitted to a large Georgia hospital, while 35 per cent of these patients have nutritional anæmia. Last year, Dr Boudreau said, there were at least 100,000 cases of pellagra in the South. He referred also to a dietary survey of low-income families in Toronto which showed that "on the average the diets of the women and children were deficient in every important ingredient including total calories." The explanation

of the deficiency in calories is not that people cannot buy enough bread and sugar but that the type of diet which they are able to afford is unappetising In urging the needs for a well organised programme of improved nutrition, Dr Boudreau said "we are beginning to appreciate that the effects of nutritional deficiency are more serious and permanent that we had believed, and on the other hand that the benefits of an abundantly adequate diet are greater than we had any reason to expect"

VALUE OF ROUTINE RADIOGRAPHY

In 1932 Mills and Stewart[1] tested 353 patients in the Swedish Hospital in Minneapolis with the intradermal tuberculin test and then examined the 67 positive reactors radiologically Of the full number tested, 1 4 per cent were found to have reinfection type tuberculosis In 1935 Hodges[2] made a survey of 1101 consecutive admissions to the Michigan University Hospital or to its outpatient clinic during a period of a fortnight and found that 1 3 per cent of the patients had significant chest disease and 0 5 per cent pulmonary tuberculosis which would have been undiscovered without radiography These results were quoted by E X Mikol and R E Plunkett in a paper read to the American Sanatorium Association in Boston on June 26 They had remarked that some 10 per cent of the deaths from tuberculosis in upstate New York in 1936 and 1937 took place in general hospitals which had no special provision for the care of tuberculous patients Of the deaths from pulmonary tuberculosis, which comprise nearly three quarters of the group, no less than 61 per cent had not been recorded as cases of tuberculosis at the time of their death It was thereupon decided to make a survey of a random sample of the hospital population of New York state Each hospital was allotted a number of X ray films varying from 250 to 500 according to the number of admissions and was requested to make a single flat film of the chest of every patient 15 years of age or over admitted, excluding only those known to have tuberculosis, those admitted to a tuberculosis service, outpatients, and those too acutely ill to be disturbed Due to unforeseen administrative problems, consecutive X rays were found to be impossible, but Mikol and Plunkett believe that this fact has not seriously affected the unselected nature of the sample

Of 4853 films studied, 2 6 per cent showed evidence of reinfection type of tuberculosis, 1 1 per cent showed radiological characteristics of clinically significant tuberculous lesions and in 6 additional cases indications of significant tuberculosis were found but the diagnosis could not be confirmed because the patients had been discharged Of the 51 clinically significant cases, 24 had been regarded as suspicious by the visiting staff However, in 27 cases, or 0 6 per cent, the radiogram provided the first suggestion that the patient might have tuberculosis Applying this figure of 0 6 per cent to the adult admissions to hospitals throughout the whole United States for the year 1937 an estimate of 40 000 cases of pulmonary tuberculosis is reached The potentialities of reinfection both of the hospital staff and of other patients is the first practical lesson to be drawn from this research The authors also draw attention to the possibility of utilising the general hospital as a medium of case finding in tuberculosis, and finally they point out that routine radiography is of value in disclosing non tuberculous thoracic conditions

1 Mills W., and Stewart C A., *Minn Med* 1933, 16 122
2 Hodges P J *Ann. Intern Med.* 1936 9, 1639

MEDICINE AND THE LAW

The Defence of the Split Mind

A LEGAL contemporary expresses the misgivings of the legal profession over the defence of schizophrenia in criminal trials Its comments are made in connexion with a recent prosecution at Nottingham assizes A boy named Hayter joined the army when 16, giving his age as 18 At the age of 20, being a private in the Royal Army Ordnance Corps, he set fire to stores and tyres at the Chilwell depot, causing damage to the amount of £36,000 There was no suggestion that he was connected with any subversive movement Dr J H Murdoch, the medical officer at Lincoln prison, who attributed Hayter's act to the conditions of the "split mind," said that the accused felt that the social system of the country was not as it should be and he desired to register a protest against it, he needed care and control The judge sentenced him to detention in a Borstal institution for a period of three years, adding the philosophic reflection that he wondered what would have happened to Hayter in some other countries if he had there done the damage which he did at Chilwell

The legal journal to which reference has already been made asks how far the defence of the split mind is to go The recently convicted members of the I R A, it observes, might also claim to justify their actions on the ground that things are not as they should be and that a man must make his protest The lay press evinces a little interest when an accused person can be described as another case of Dr Jekyll and Mr Hyde Barristers who must find something to say in mitigation of sentence are grateful for any material Any young man who is fed up with the discipline of the army and who occasionally feels impelled to kick over the traces may be comforted by the attribution of his wayward impulse to some high sounding scientific cause But schizophrenia has not yet made much headway with the bench, even though it may be studied in the prison

THE LANCET 100 YEARS AGO

July 6, 1839, p 553

A quotation from William Heberden

"The deference which is sometimes required in physic to the authority of the ancients, would incline any one to suspect that the improvements in the art of healing had not kept pace with those which have been made in other branches of natural knowledge Philosophers have long ago thrown off Aristotle's tyranny, yet some physicians still choose to wrangle about the meaning of the ancients, rather than to consult Nature herself Are they afraid of approaching her immediate presence, without making use of the intercession of Hippocrates and Galen? And is that reverence to be still paid to her once faithful ministers, which is properly due to Nature alone not withstanding all that Bacon, and Harvey, and Newton, and our other great reformers have witnessed against this mistaken veneration? In works of genius the ancients are unquestionably our superiors and best patterns but in that sort of knowledge which depends wholly upon experience, the latest writers must in general be the best Experience may, in politics and morality, be called the teacher of fools, but in the study of nature there is no other guide to true knowledge accordingly the practice of physic has been more improved by the casual experiments of illiterate nations and the rash ones of vagabond quacks, than by the reasonings of all the once celebrated professors of it . . "

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month, his name can be seen later in the half-yearly index

FROM A WOMAN PUBLIC-HEALTH OFFICER

II

LIKE Their Majesties and Christopher Columbus, and several of my predecessors in these pages, I have travelled to the New World and found it good. Though my voyages made less stir than those of some of the above-named, I doubt if any of the travellers enjoyed themselves more. Believe me, the best way to visit a new country is to have good enough official and social introductions to open the door to anything you want to see—and yet to be sufficiently unimportant to slip off "truly exploring" by yourself whenever the mood takes you Only thus can one hope to include both the Great Ones of the Earth and the "nice people, with nice habits, but no money at all" who constitute the bulk of humanity

My journey to the States as the guest of a great philanthropic trust fund began rather inauspiciously in Canada. I nearly disgraced myself by saying to a learned professor, introduced as a "follower of Dr Watson": "I'm so glad to meet another Sherlock Holmes fan over here"—fortunately this was mistaken for an example of English humour, but in sober truth I had underestimated the importance of the Watsonian school of psychology. Later one learnt better. . . . In Toronto one found an extremely well-organised system of public-health and psychiatric services, which I mention because the English medical visitor often misses them Here also is a remarkably interesting court—unique, I believe, in the British Empire, for it is presided over by a woman judge, and a doctor not a lawyer at that. Her jurisdiction seemed to include all crimes except murder and treason, and she dealt with all delinquent women and children, all men charged with offences against women or children, and men who misguidedly got a woman pal to assist when "on a job" Never have I seen such a ruffianly clientele in any court—during a morning spent beside the judge on the bench one learned quite a lot. . . . In the train that took me over the U.S.A. border an innocent query to the conductor brought the pitying question: "Say, sister, where are you from?" "From London" "You must sure mean London, *England*, or you wouldn't be so ignorant" (I'd forgotten London, *Ont*.) That's a good line for a British visitor to remember. . .

* * *

One has almost forgotten that in 1927–28 the U.S.A. were enjoying a marvellous boom period What a joy after the gloom of post-war England to see a country bathed in material prosperity! It was like watching children at a really good Christmas party. Even the women prisoners in the night courts had better fur coats than I, the working men had splendid food and decent little homes, and, best of all, the young had justifiable hope in their hearts that the world had a use for them and their labour, nor were the standards wholly material, for I can swear to an immense communal feeling, a passionate desire for education, and a real love of beauty and culture One saw museums fit to enshrine great masterpieces of art, hospitals that towered to the sky, and millions poured out in charities. And, if much of this wealth has vanished like fairy gold, America can at least remember that she used her money not ignobly when she had it—and would do so again

A fly in the ointment was the comprehensible but maddening incapacity of certain of my hosts to understand why so many English workers perversely persisted in being unemployed Less excusable was the way in which many highly placed British visitors played up to this attitude and left a trail of disgusting slanders on the broken men of the Clyde, the Tyne, and South Wales. I caught one at it in Chicago and can only regret that he escaped—though narrowly—with his life

The work in child guidance that one had specially come to see had flourished apace in the general prosperity. Nothing lends itself more to sheer quackery or to humourless extravagances than does "psychology," especially when applied to children Examples were not far to seek, but the clinics to which we were shepherded by our hosts of the Commonwealth Fund were for the most part as austere as they were costly Only the best in the way of academic qualifications and scientific methods were good enough for the "maladjusted" child, and the whole scheme was organised with a quite uncommon common sense Had we anything to learn from them? our hosts asked modestly. Definitely we had And they have given since with both hands that Great Britain might reap the benefit of American ideas and experiences.

* * *

Although in 1927 the word "depression" meant less to the average American than "hang-over," there were plenty of snags in the stream of prosperity. One of them was the eternal problem of the "melting-pot" No amount of reading or intensive study of the movies prepares one for the reality Wait till you see those hordes of strange flat faced industrial workers—from countries that one never heard of till Hitler taught us Central European geography Wait till you drive along a three-mile avenue in Chicago and look in vain for a white face on the crowded side-walks Or come and scan the long charge-lists in the juvenile courts with their patronymics drawn from half the races in the world. Then you may begin to understand the difficulty of tackling any social or political question in such a composite nation . . And yet it is a nation . . . Jane Addams (one of the great people who didn't disappoint) showed me maps which demonstrated how the racial constituents of her neighbourhood in Chicago had completely changed three times in her lifetime (The races in America tend to live together in agglutinated masses, and where the edges touch crime and discord are rife) Now in 1927 had come a new wave, a horde of Mexicans imported as cheap labour for the then booming industries I was asked to help at an "Americanisation party" for them and found it very different from the flag-wagging affair one had supposed The very shy older people, who were with difficulty coaxed in from the street, were given their favourite foods and drinks, and once wreathed in smiles were invited to show what they could do in the way of native handicrafts, folk-songs, and cookery. Far from being

hastily mechanised they were encouraged to pass on their native culture to their own children, to enrich the American heritage. "It's a shock to most of these poor undervalued folk to learn that they have anything worth while to give us," said Miss Addams. "Heaven forgive us, we've only just realised it ourselves." The main trouble very often is to persuade the European peasant to give enough freedom to his American born child—and to persuade the child that even a foreign speaking mother sometimes knows best. From the clash comes a great part of American crime.

Certainly the American child, if tough, can be very tough. A boy on remand was expounding to the court psychiatrist the mysteries of the Forty Club, whose initiation fear was—and perhaps still is—to steal a car of a greater value than a Ford. "Why the *Forty*," he was asked, "Aw, sap! Where was you raz? Never heard of Ally Babba?" We—the psychiatrist and I—duly found the headquarters of the Club that night in a squalid side street with costly cars parked round the door to witness that the young neophyte did not lie.

Not less baffling was coloured Sadie, aged 8 plus, with two pigtails, great innocent eyes, and an appalling record of varied misdeeds. Angelic at first, she became very naughty during a psychological test, and the doctor mildly remarked that he would hate to see a little girl of his own behave like that. "Yo go home and hand dat stuff to yo wife," she shot out at him. Seeing that my presence was unwelcome, I left the room and learnt later that Sadie immediately sidled up to the doctor, thrust a pencil into his hand and begged "Now, yo play a game wid me!" The doctor wisely asked further details—"See which of us two's can writ down de mos' bad words. Ain't dat a *cute* game?" One doubted whether a team of professors of psychiatry and psychology, even if reinforced by an old Nannie with a slipper, could deviate Sadie from her appointed path through life.

* * *

The chief difficulty, however, with which child guidance clinics had not infrequently to contend was a certain sketchiness in the ethical standards of the community in which they worked. Children are not fools, they watch what their elders do rather than what they say, especially if the deeds rather than the good advice accord with their natural instincts. At one clinic I visited it appeared that a large adjacent building was used as an illicit brewery (under Prohibition) and as a depot for stolen motor-cars. The doctors or social workers while examining their little charges (accused perhaps of stealing a few cents) could watch a highly skilled gang of negroes dismantling the stolen cars. One day a magnificent Hudson Super six was driven in, and the psychiatrist could bear it no longer. He telephoned the police, who took over an hour to arrive—and then could find no car on the premises. Later he learned from amused colleagues that the whole place belonged to one of the highest officials in the city. The doctor told me he meant to quit. "I can't make sense of it all. I wonder if the kids can."

This really tragic (though diminishing) factor in the American scene did bring home the importance of encouraging decent people to do the drudgery of public administration—and of not crabbing them too hard when they are at it. I can never hear the stock sneers against Parliament and municipal bodies without wishing the critics could get the administration they are really asking for. If there is no tradition that honest men should give this kind of public service, and if the supply of honest men slackens, then crooks come into their own. And if public office once gets a really bad reputation decent men dare not take it. From this vicious circle America is struggling hard to extricate herself.

PANEL AND CONTRACT PRACTICE

Unwise Comment

A CASE heard before the London medical service subcommittee shows how careful hospital officers should be in criticising, however mildly, the treatment given by doctors outside. A man had been treated by his insurance practitioner on many occasions for rheumatism, lumbago and the like. Last December he went to the doctor and was diagnosed as suffering from sciatica, for which he was treated first with medicines and then for a fortnight with electricity at a clinic. A few days later the doctor visited him and found him to be suffering from bronchitis, the leg being rather better. Under treatment the bronchitis improved but the pain in the leg became worse, and the doctor suggested admission to hospital. After about a week he was admitted, and the condition was there diagnosed as right-sided femoral thrombosis. The man's own story was that on his admission his leg was swollen from foot to thigh, and that the hospital doctor told him that the ointment which he had been applying, which had been prescribed by the insurance practitioner, was useless for the treatment of that condition. In a letter to the insurance practitioner the hospital authorities said they were unable to determine whether the man's sciatica had any relation to the thrombosis.

The insured man and his wife complained to the committee that the practitioner had been negligent in his treatment in that he had wrongly diagnosed the condition present, but the committee found that the treatment provided by the practitioner was proper and adequate for the condition which he diagnosed, a diagnosis which was fortified by the previous medical history. They expressed regret that the man had been told on admission to hospital that the treatment given was not suitable, and they were doubtful whether any question would have been raised if this remark had not been made.

The period between the man's first visit to the doctor and his admission to hospital was just over two months, and clearly thrombosis was not present for all that time. While the practitioner may not have diagnosed the new condition—and he said quite frankly that he did not disagree with the hospital opinion—it would be intolerable if practitioners were held guilty of negligence merely because they made a wrong diagnosis. All that any doctor can be expected to do is to apply "reasonable skill and care in the treatment of his patients" and this is all that the regulations require of him.

Contraceptives

In answer to a question about the position of insurance practitioners who are asked for advice about contraceptives, the insurance acts committee of the British Medical Association have expressed the opinion that if the condition of the patient is such that the practitioner should give contraceptive medical

treatment or advice, such treatment or advice would be within the scope of his agreement

Essex Public Medical Service

The report for 1938 shows that this service is making steady progress The number of subscribers has now risen to 21,000, an increase of nearly 2000 over 1937, and the increase would have been larger still but for the number of fourteen-year-old subscribers who came off the books owing to the extension of national health insurance. The great distress that is prevalent in parts of Essex owing to the slowing down in the building trade also led to many cancellations. The number of active medical members of the service is 305 No distinction is now made in rates of subscription between adults and children, the weekly payment, which includes drugs and administration, ranging from 4*d.* a week for one person to 1*s.* 3*d* a week for a family of six. The service has no difficulty in paying its way and showed a surplus of £650 for the year, most of which will be distributed to members as a bonus

A Record Quarter

During the first quarter of this year the number of prescriptions issued by insurance practitioners in London reached the record figure of 3,015,846, costing £101,661, as compared with 2,571,840, costing £87,091 in 1938 The increase was partly due to a rise of some 43,000 in the number of insured persons, but the average cost per person also rose from 11 20*d.* in 1938 to 12 78*d.*

PUBLIC HEALTH

Another Side of the Defence Programme

THE Prime Minister and the Minister of Labour have expressed natural pride in the results of the physical examination of the militia recruits. These suggest, no doubt, that our social and health services have been developing along sound lines, and are a testimony to the merits of preventive medicine, though the possible fallacies of this deduction are considered in a leading article on another page There is, however, another aspect of the problem. Medical practitioners are becoming increasingly conscious of the effects of the emotional side of life on physical and mental health. Anxiety states are becoming commoner in young people, and illness may sometimes be an unconscious escape. In other cases there are restlessness and irritability, if not actual misdemeanours, with unfortunate effects in and outside the home Some of this may be an inevitable result of the increased momentum of modern life, with its accompaniments World conditions also tend to increase any feeling of insecurity or fear that is present. Parents in the past have seldom been adequate guides to their children on the so-called facts of life, and today there is a changed relationship between them. Something has been gained by the change, but much has been lost, and helpful counsel has too often accompanied discipline in its flight. The freedom of modern youth is exercised in an atmosphere of sex stimulation greater than ever before, and though the course of the whole life is usually determined in the unstable years of adolescence any preparation and guidance for these critical years of adjustment have been almost left out of our educational system.

The deputation of youth leaders last month to the Minister of Health and the President of the Board of Education was anxious to see something more being done to give help and guidance, and to prevent the physical and nervous casualties which present conditions make only too easily. They were able to show that the years from 14 to 25, in addition to juvenile delinquency, produced most cases of illegitimacy and venereal disease It was further disclosed that of four million young people between the ages of 14 and 18 less than three-quarters of a million were within the influence and care of the youth organisations The deputation expressed a fear that emergency conditions might slacken self-discipline and self-control, and their plea was for the Government departments concerned with health and education to grapple with this part of a real defence programme. Sir Walter Langdon-Brown (chairman of the British Social Hygiene Council) and Dr. Vynne Borland (Society of Medical Officers of Health) spoke of the need for an adequate preparation for life This means instruction for parents, more and better biology in schools, and simple scientific and psychological information for adolescents about themselves and also concerning their responsibilities as future citizens and heads of families Where these things have been done their value has been proved. Local authorities can provide these services; some of them do, but many do not. Insurance committees can also help Government stimulation of local effort is desirable, but these services are being curtailed by lack of funds We trust the deputation was successful in convincing ministers that money so spent would be a defensive investment.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 24, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0, scarlet fever, 1597; diphtheria, 783; enteric fever, 54 (29 "expected"); pneumonia (primary or influenzal), 520; puerperal pyrexia, 186; cerebrospinal fever, 20; acute poliomyelitis, 12; encephalitis lethargica, 3; dysentery, 43; ophthalmia neonatorum, 87. No case of cholera, plague or typhus fever was notified during the week.

Twenty cases of enteric fever were reported from the county of Glamorgan distributed thus: Rhondda 13, Pontypridd 4, Llantrisant and Llantwitfardre 2, Swansea 1 The other 34 cases were reported in ones or twos from 11 county boroughs, 2 metropolitan boroughs, 10 urban districts, 3 rural districts, and 1 port

The number of cases in the Infectious Hospitals of the London County Council on June 30 was 2847, which included: Scarlet fever, 665, diphtheria, 513 (carriers, 17), measles, 20; whooping-cough, 784; puerperal fever, 19 mothers (plus 12 babies), encephalitis lethargica, 305, poliomyelitis, 3 At St Margaret's Hospital there were 24 babies (plus 11 mothers) with ophthalmia neonatorum

Deaths—In 126 great towns, including London, there was no death from smallpox or enteric fever, 7 (0) from measles, 3 (0) from scarlet fever, 12 (3) from whooping-cough, 13 (1) from diphtheria, 35 (7) from diarrhœa and enteritis under two years, and 8 (1) from influenza. The figures in parentheses are those for London itself.

Stoke-on-Trent reported 4 fatal cases of measles, Birmingham 2 Fatal cases of diphtheria were scattered over 11 great towns, South Shields reporting 3 Southampton had 4 deaths from diarrhœa, Birmingham 3

The number of stillbirths notified during the week was 231 (corresponding to a rate of 34 per 1000 total births), including 38 in London.

LETTERS TO THE EDITOR

STAFF CONDITIONS IN THE HOTEL INDUSTRY

SIR,—As a student of occupational hygiene, and a firm believer in the need for every worker to have a proper holiday each year with pay, I have been increasingly concerned to find serious shortcomings in the conditions of employment in the hotel and catering trades These trades are the mainstay of the holidays the rest of us enjoy It is therefore disconcerting to find that not only do hotel workers have to rely on the uneven flow of tips in order to obtain a living wage but that the hours are often very long and proper time for recreation lacking

Your columns, Sir, may not be the place to discuss economic matters in detail, but I trust you will allow this problem to be ventilated as a public-health issue Holidays have important prophylactic and therapeutic value They lie at the root of much of the work of the national fitness movement The time has come to see that those who work at the task of giving to others health and vitality during the best parts of the year should not be left unconsidered They too should have light and air, good working conditions, proper pay and adequate holidays Their standards of living should not be dependent on gratuities and the whole question should be the subject of full investigation and public consideration at an early date If every doctor would make it a self imposed task to inquire about staff conditions in the hotels and boarding houses in which they stay this summer, I think many will have their eyes opened to matters which have for too long been taken for granted

It is only fair to say that management is not necessarily to blame for shortcomings Methods of taxation and rating, the absence of a proper code of hygiene enforceable equitably on all establishments and the unregulated demands of the public make it almost impossible for some establishments to survive com petition and at the same time give their staffs the conditions they would wish This is not a question for recrimination but mainly one for objective inquiry and common sense, fair and equitable regulations

I am, Sir, yours faithfully,

Beeston, Nottingham June 27 L P LOCKHART

AN ORTHOPÆDIC UNIT FOR CHINA

SIR,—During the past year the Chinese Red Cross has come to realise the importance of orthopædics in war surgery and has sent an appeal for help to the British Orthopædic Association We are asked to provide a relatively small (250 beds) teaching unit, to be established well behind the Chinese lines, and a surgical director whose business it will be to instruct Chinese surgeons in orthopædic surgery, so that they will then be able to deal more competently with the enormous numbers of wounded at other military and civilian hospitals The sum required is £3500—£10 for the provision of each bed, and £1000 for special equipment in the practice of orthopædic surgery

It is unusual for a small and purely scientific society like the British Orthopædic Association to undertake a responsibility of this kind, but the appeal is such that it cannot be refused. The members of the Association have already given over £1100 (the list of donations is below), but they cannot possibly subscribe the whole amount themselves We are therefore asking, in coöperation with the British Fund for the Relief of Distress in China, for the aid of the medical profession as a whole

These are difficult times, but there was never a period when it was so desirable to show that medicine is international in deeds as well as in words This country has given the world Sir Robert Jones, the greatest orthopædic surgeon of all time, and it is natural that another country, desperately in need of enlightenment in the treatment of limb and spinal injuries, should look to us It is proposed to call the surgeon who goes to China "The Robert Jones Emergency Relief Surgeon"

The urgency and the importance of this appeal cannot be denied, if generous support is immediately forthcoming it will be possible to dispatch a surgeon with little delay, as arrangements for the administration of the fund in China have just been completed

Donations may be sent to either of the undersigned and should be marked "orthopædic"

We are, Sir, yours faithfully,

NAUGHTON DUNN,
President British Orthopædic Association,
15, Calthorpe Road, Edgbaston,
Birmingham,

H GORDON THOMPSON,
Executive Secretary and Treasurer, British Fund for the Relief of Distress in China,
121, Westbourne Terrace, W 2

PS.—The following sums have been received from members of the Association whose names appear below two donations of 100 guineas, one of £50 14s 10d, six of £50, one of 25 guineas, eleven of £25, three of £20, one of 15 guineas, two of £15, one of 10 guineas, four of £10, nine of 5 guineas, three of £5, one of 4 guineas, four of 3 guineas, one of £3, seven of 2 guineas, and eleven of 1 guinea Total £1126 10s 10d

Anon, R Barnes W R Bristow, E P Brockman, Ralph Brooke, B H Burns, R W Butler, A L Capener, C Hope Carlton, A Chance H Chitty, J A Cholmeley, H Osmond Clarke, S G Davidson, J Dawson, Naughton Dunn W J Eastwood, A L Eyre Brook, W B Foley, L Forman A Fowler, Sir Harold Gillies Prof G R Girdlestone, A M Hendry, G Hyman, C Gordon Irwin S T Irwin, Miss Jebens, L B Jones C R M Jones, R Watson Jones C Lambrinudi, R S Lawson G Lillie, — Kelly, B L Mckarland, T P McMurray Grant Massie, W Mercer, G P Mills, S M Milner A Mitchell, Mrs Morley, R C Murray T P Noble Viscount Nuffield, G T Partridge J H Paul Herbert A Quine, J R Ratcliffe, A Rocyn Jones N Rocyn Jones Prof Lambert Rogers J C Scott, H J Seddon, W Sharry, J F H Stallman R Stirling, R G Taylor, V J M Taylor C L Thomas, Alan Todd, D Trevor W F Tucker, Philip Wiles F Aitken Walker, J B Ferguson Wilson

THE PROBLEM OF MEDICAL LITERATURE

SIR,—The suggestions outlined by Professor McDowall, Mr Lloyd, Mr Zachary Cope, and Mr Barnard indicate the need for a conference at which the problem may be fully discussed, both from the medical man's and the librarian's viewpoints Discussion should include the ideas of both the user and the administrator of the literature. I venture to add the following remarks —

(1) The need for the publication of a British journal abstracting medical literature is very real and the arrangement of this periodical might be based upon that of the *Quarterly Cumulative Index Medicus*, although more frequent publication is highly desirable

(2) Unofficial coöperation between librarians to persuade their committees to drop subscriptions to periodicals is most dangerous for the following reasons (*a*) journals duplicated in most libraries are those in most demand, and to expect to borrow them from another library for any length of time is fallacious, (*b*) when a research worker requires a book he usually wants it at once and cannot be expected to wait while the librarian sends to the nearest library stocking it, where it is quite possibly in use, and (*c*) a library cancelling the subscription

to a periodical cannot be sure that this will always be available at the library at present willing to lend it, and to make up sets by the purchase of back numbers is often extremely expensive.

(3) Most medical men belong to certain medical societies, and those in London have access to some of the largest collections of medical literature in existence. They cannot expect any one library to stock everything, and the existence of published catalogues of medical libraries and of joint catalogues makes the tracing of papers comparatively easy.

(4) Many libraries are most willing to borrow but not to lend, and this is often caused by the attitude of members of the staff who are very annoyed when a required volume is found to be on loan to another institution.

(5) The idea of a central library taking every periodical and the more expensive monographs is to be commended, and, if it could duplicate the stock so that a copy would be available for reference and another for loan its importance would be enhanced.

(6) Although many libraries will not lend their stock, few librarians will refuse to allow a person to consult the books under his care.

(7) The main problem appears to be a matter of finance. An abstracting journal would have to be promoted; abstractors and translators must be paid, and libraries are at present notoriously understaffed. The money will not be raised by cutting down subscriptions to periodicals; it would be better to increase present facilities by cooperation for the mutual loan of rare material and of reproductions of more modern papers by the photostat and microphotography. The interchange of duplicates and of unused material is also a source but little exploited at the moment, despite the fact that most libraries are cramped for space.

These are some of the points that would have to be considered in any attempt to solve the problem.

I am, Sir, yours faithfully,

JOHN L THORNTON,
Librarian

St Bartholomew's Hospital Medical College,
E C 1, July 3.

ERGOTAMINE TARTRATE IN MIGRAINE

SIR,—In my letter in THE LANCET of July 16, 1938, I endeavoured to dissipate the doubts as to the effect of continued treatment with ergotamine tartrate (Femergin Sandoz) expressed in communications I received from medical men all over the country, following the publication of my experience of this alkaloid in your issue of March 27, 1937. In this letter I stated that for over a year I had used the alkaloid prophylactically and had injected the contents of a 0 5 c cm ampoule (containing 0 375 mg. ergotamine tartrate) every night without ill effect of any kind thereby completely eliminating the morning headache that I had always experienced on awakening.

As another year has now elapsed, during which I have continued this practice without a day's intermission and again without the slightest ill effect, I feel that this somewhat unique experience should be recorded. With the exception of Macdonald Critchley, who has referred to two cases receiving 0 4 and 0 7 c cm femergin daily for two years and one year respectively (*Medical Annual*, 1939, p 336), none of the workers who have had extensive experience of the treatment (including such authorities as von Storch, O'Sullivan, Graham and Wolff) mention anything approaching so long a trial—i e., two to three injections a week for a year and a daily injection for the following two years. I would also like to record the case of a patient.

A lady of 74 had suffered all her life from a severe and incapacitating migraine, in which, as in my own case, the attacks steadily became more frequent as she grew older, until she was scarcely ever free At the time she began treatment with ergotamine in June, 1937, she was debilitated, could only partake of a very restricted diet and had lost a lot of weight. She received so much benefit, although only taking tablets orally with an occasional injection, that in March, 1938, she began having a 0 5 c cm. ampoule injected every night. This led to great improvement, but she was still not completely free from headaches As her attacks were much more severe than my own, I thought that a larger dose was indicated in her case, and in August last she began taking 1 c cm. regularly every night This proved effective and after a daily injection for 15 months she is much better in general health than she has been for years, is exceptionally active physically and mentally, has gained 14 lb. in weight, can eat anything, and is, as she says, "a new woman."

I think that the cases of this lady and myself are strong evidence that the fears expressed in regard to the danger of continued treatment are greatly exaggerated.

I am, Sir, yours faithfully,

Desford, Leicester, July 1 T. W. GORDON KELLY

RENAL IRRITATION DURING SULPHONAMIDE THERAPY

SIR,—In September, 1938, Robertson [1] reported a brisk hæmaturia which appeared on the third day of M. & B 693 treatment of a boy, aged 14, with pneumococcal meningitis, and lasted two days; he suggested that it was due to the drug In March, 1939, Adalja [2] reported a case of hæmaturia during treatment of a pneumonic patient with M. & B 693, the hæmaturia ceasing on withdrawal of the drug. Gross and Cooper [3] and Antopol and Robinson [4] simultaneously reported finding urinary calculi in rats, rabbits, and monkeys, after receiving the same drug. This seems to indicate renal damage, in which case the following facts may be of interest.

During the past few months 75 male patients with gonorrhœa have been treated with M. & B 693 or with Uleron at the V.D. clinic, Royal Victoria Hospital, Belfast Routine microscopical urinary examination revealed the presence of red blood cells in 35 (46 6 per cent) cases: 29 out of 65 treated with M. & B. 693, and 6 out of 10 treated with uleron. In the case of M & B 693, 26 of the patients showed the cells either during treatment (8 cases) or within the first five or six weeks following cessation of chemotherapy With uleron 5 cases demonstrated the phenomenon during chemotherapy and 1 within two or three weeks following the end of treatment In no case was the dose of either drug excessive, the maximal dose with M & B 693 being 29 5 g over a period of fourteen days, and with uleron 36 g given in three four-day "stosses," the "stosses" being separated by eight-day intervals In most of the cases treated with M & B. 693 dosage varied from 15 to 22 g over a period of seven to ten days

Trauma was a possible explanation in 6 cases, for the appearance of the red blood-cells followed within a short time after instrumentation, but in 5 of these red blood-cells were also found either before or months after mechanical interference. Most of the cases showed the cells on more than one occasion, and several were still exhibiting them on their default several weeks after cessation of chemotherapy

Except in 4 cases, the laboratory report was "nil or occasional red blood-cells" In the 4 exceptions

1 Robertson, K., *Lancet*, 1938, 2, 728
2 Adalja, K. V., *Brit med J* March 25, 1939, p 643
3 Gross, P., and Cooper, F B., *Ibid*, May 20, 1939, p 1055
4 Antopol, W., and Robinson, *Proc Soc exp Biol*, N Y 1939, 40, 428

a "moderate number of red blood cells" was found on one or more examinations Oxalate crystals were found in 3 instances, and casts but no red blood cells were reported in 1 case with M & B 693 Oxalate crystals but no red blood cells were found in 1 patient who had been treated with uleron In 2 cases red blood cells were also found before chemotherapy Red blood cells appeared in 1 case during a first course with M & B 693, but no reappearance was noted after a second exhibition of the drug In 1 case cells were found during a second but not during the first course of the drug In 1 no red blood cells were reported during two courses of M & B 693, but they were found on several occasions during and after subsequent treatment with uleron, and 1 case showed red blood cells after treatment with M & B 693 but has not so far had a repetition of the condition despite one five day 'store' of uleron He is still on treatment

Examinations of the concentrations of M & B 693 in the blood and urine were carried out by Werner's[5] method in 7 cases, and of these 4 showed a maximum of the free drug in the blood of over 4 mg per 100 c cm and 2 a maximum of over 6 mg per 100 c cm A urinary maximum of the free drug of over 170 mg per 100 c cm was found in 5 cases, 3 showing over 200 mg per 100 c cm In another case the 'combined' drug was almost four times as great as the amount of "free" throughout treatment, an unusual finding in my experience

As pointed out, the dosage in this series was small In view of the heavy dosage at present suggested by a number of workers, I feel that this preliminary report is justified

I am indebted to Dr J C Rankin and Dr H E Hall, of the V D clinic, Royal Victoria Hospital, Belfast, for permission to publish these reports, to them and to Prof E B C Mayrs, of the department of pharmacology in Queen's University, Belfast, for their helpful criticism and advice, and to Dr J Houston, of the department of pathology, Royal Victoria Hospital, for most of the microscopical urinary examinations

I am, Sir, yours faithfully,

J S McCANN

V D Clinic, Royal Victoria Hospital, Belfast, and Department of Pharmacology Queen's University, Belfast, June 28

UNORTHODOX TERMINOLOGY

SIR,—I was almost "terrified" this morning, when by chance I read the comment of "Dr Pangloss" in THE LANCET, June 24, p 1462, on my article in the issue of June 17, p 1395 Of course I know that "terra" means "dry," because we have a river in Catalonia which is always dry, for which reason the Romans called it the 'Ter' "Terra" means dry and means "death," too, as opposed to "water" (wet), which means "life" This was known in ancient times and is the reason why the Egyptians, for instance, used the "rice test" to detect criminals, it was supposed that those who had committed a crime should be terrified (dry) and could not swallow the rice Everybody knows that fear compels the individual to drink to overcome his "dryness"

I admit that my etymology may be unorthodox, and I thank "Dr Pangloss" for his teaching, but, still, it seems to me easier to connect *terr* or with *terra* than *terr* or with *trem*-or

I am, Sir, yours faithfully,

E MIRA

Maudsley Hospital, Denmark Hill, S E 5 June 29

[5] Werner A E A, *Lancet* Jan 7, 1939 p 14

PRESENTATION TO SIR ROBERT KELLY

SIR,—A committee, consisting of representatives of the Liverpool Royal Infirmary and other teaching hospitals, Liverpool University, and of his old surgical registrars and house surgeons, has been formed to collect funds for the purpose of presenting Professor Kelly with his portrait, and in addition of perpetuating his name by a scholarship in association with surgical teaching or research at the University

The appeal is being circulated to members of the above institutions, but it is felt that other medical men might like to associate themselves with the presentation Subscriptions should be made payable to the University of Liverpool, and should be sent to the finance officer at the University

I am, Sir, yours faithfully,

HUGH REID,
Secretary to the Committee

Liverpool June 30

OBITUARY

WILLIAM MOSES FELDMAN

M D LOND, F R C P, F R S E

THERE can be few men who combined such a deep book learning of child hygiene with practical experience as Dr Feldman, who died suddenly on July 2, at the age of 58 He was born in Russia, the son of Israel Feldman, a merchant, and educated at the Jews' College and at the London Hospital, where he qualified in 1904 He went at once into general practice in the Whitechapel Road, where he remained all his life, at the same time doing non-resident appointments at the London Hospital Child welfare was his main interest from the first, and in 1907 he published his book on "The Child its Rearing, Development and Ailments," followed soon afterwards by his "Manual of Nursery Hygiene" He became physician to St Mary's Hospital for women and children and to the East End Dispensary At the same time mathematics was his hobby, and he applied it to such problems as calculating the number of capillaries in the human body and its surface area He found time too, to busy himself with social work, more particularly on behalf of the Jews, and he was a member of the Stepney borough council and of the council of the Society for the Study of Inebriety He lectured for the London county council on midwifery and hygiene and in 1924 he gave a Chadwick lecture on antenatal and postnatal child physiology, he also examined for the General Nursing Council He had a constant urge to write, his most ambitious work being his "Ante and Post natal Welfare," published in 1927 In this remarkable compilation he reviewed methods of promoting the well being of children from every angle—historical, literary, biological and practical, and such was his grasp of the subject that he made even the more technical aspects easily comprehensible

In 1913 Dr Feldman married his cousin Hilda Feldman They had no children

TRAINING FELLOWSHIP IN PSYCHOSOMATIC RESEARCH.—The Rockefeller Foundation has made available for three years from Sept 1 a training fellowship of the annual value of £150, which is tenable at the Tavistock Clinic Further particulars are given in our advertisement columns and application forms may be obtained from Dr A T M Wilson, Tavistock Clinic Malet Place, London, W C 1

Wellcome Historical Library

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

THE discussions in the House last week were for the most part on the Finance Bill, three days, the Armaments Profits Duty one day and unemployment for the wind-up of the week on Friday. The Minister gave statistics to show the increase of those registered as employed. The opposition pointed to the serious condition of the areas where unemployment reached a high percentage of the available labour. As one member said, "There is a total of 25,999 people in Durham county who have not worked for more than a year." It is very little help to these people to know that others are employed.

* * *

The question of unemployment must for certain statistical purposes and for the purpose of the unemployment insurance benefit be considered from the point of view of numbers But these numbers require careful interpretation if the effect on the body politic of the disease of unemployment is to be accurately diagnosed and adequately treated Long-term unemployment—as was brought out in the debate—produces "devastating physical effects" The director of education of Durham county has shown recently that 16 8 per cent of the secondary-school pupils in Durham are suffering from undernourishment and he suggests that "something should be done" to provide solid meals for those children A comparison between pupils in Durham and pupils in Surrey was interesting—the Durham (Spennymoor) pupils were about one year behind the Surrey (Surbiton) pupils in physique The medical officer concerned was quoted in the debate as saying, "In my opinion the returns are indicative of a deterioration in the nutrition of a proportion of the children formerly classified as normal. This deterioration has occurred in spite of the fact that the number of children receiving free milk in the secondary schools has increased each year since the scheme was inaugurated, and, as in the case of the elementary schools, I am disposed to recommend the provision of solid meals in the secondary schools"

Mr. Joseph Stewart, who dealt with this case, showed how Durham county had had to spend £63,000 on food for elementary-school children, £30,000 on liquid milk meals and £30,000 on milk for nursing and expectant mothers, while over a million and a half was spent (in 1938) on public assistance and over five million on unemployment benefit and allowances—yet with all this "our people in the special areas are deteriorating."

Another aspect of the same problem was brought out in the report of the Unemployment Assistance Board, where, in the introduction, Lord Rushcliffe, the chairman, calls "the most serious attention" to the effect of prolonged unemployment on 100,000 young men Mr. Arthur Henderson said that a visitor from another planet would find it difficult to understand why there should be any unemployment at all The potentialities of consumption were greater than those of production

Running through the debate was an expression of apprehension. If the numbers and conditions of unemployed are as they are today with all the boom demand for employment on armaments what will they be in the future when—at some time—the piling up of armaments ceases? What is to happen in a post-war or a post-peace world with production on a normal footing? Mr. Ernest Brown, the Minister of Labour with the famous voice, did his best to be cheerful and optimistic about it But the House was not really convinced despite the vote. The question still remains to be answered: "What is the disease of unemployment doing to the body of the nation?" The House did not answer the question Perhaps it is a question for a preventive social medicine service.

* * *

This week the Government are presenting a Milk Industry (No 2) Bill in place of the one which was introduced in November last and withdrawn because of opposition on the Government side The original bill contained 75 clauses and 8 schedules, the present one contains 10 clauses and 1 schedule The proposals for pasteurisation are dropped, but "consumers' committees" are to be brought into consultation with boards and other persons before prices and terms of sale of milk are settled And payments are to be made to milk producers who produce and sell accredited milk, standard milk, tuberculin-tested milk, certified milk or milk from an attested herd One proposal, in clause 2, provides for Government contributions to milk marketing board towards the supply of milk at reduced prices for consumption by school-children, expectant or nursing mothers or children under five A bill passed last year put a sum of a quarter of a million at the disposal of the Government to pay for milk for expectant or nursing mothers or children under five, but up to last month and presumably up to the present time none of that money had been spent because the Government did not make arrangements to pay for milk distribution. The House will certainly want to know whether the "provisions" of the bill will be purely "administrative" or whether, in the future, they will have a definite nutritive value

FROM THE PRESS GALLERY

Scottish Health Services

IN the House of Commons on July 4 Colonel COLVILLE, Secretary of State for Scotland, in introducing the vote for the Department of Health, said that with a net increase of over £270,000 on last year the total estimate was brought to over £4,000,000. Housing accounted for the greater part of the increase, but among the other items showing increases were the maternity services and the Highlands and Islands medical services. The items that showed the more important decreases come under the head of national health insurance, and these decreases were due partly to a windfall from the navy, army and air force insurance fund, and, in greater measure, to the lower rate of sickness among the general insured population in 1938. A new item was the grants to local authorities for cancer treatment, the beginning of what he hoped would be an effective aid in the fight against this disease.

The department was working at high pressure on emergency work of civil defence, including the organisation of the emergency hospital service and of medical, nursing, dental and other personnel, the approval of first-aid posts and ambulance schemes made by local authorities, the evacuation scheme and the provision of camps The financial provision for this work ran into millions.

There could be no doubt, said Colonel Colville, that the health and other social services were returning a substantial dividend in the form of improved health standards. In 1938 the general death-rate, the infant death-rate, and the tuberculosis death-

rate were all the lowest on record The infant death rates in Edinburgh, Dundee and Aberdeen were now less than half what they were at the beginning of the century School health records showed that, in height and weight and general vitality, the children at different ages were better physically than their predecessors In Glasgow the boys of thirteen were 7½ lb heavier and 2 in taller than the boys examined in 1920, the girls were 9 lb heavier and 2 in taller

In regard to the Maternity Services Act passed in 1937, the initial difficulties were now being overcome, and the act was being brought into operation in different parts of Scotland Schemes under the act were in operation in the areas of 14 local authorities, another 9 schemes had been approved and would come into operation shortly, and many of the schemes of the 30 remaining local authorities were at an advanced stage It was worth noting that for the first *time in history the population of Scotland* had reached the 5 million mark, according to the provisional estimate of the registrar general

The increasing numbers of old people partly explained the increased incidence of cancer Colonel Colville hoped to issue shortly a circular to local authorities on the Cancer Act, but the full operation of the act would depend on, among other things, exact knowledge of the existing facilities in Scotland, what developments were desirable, and where An expert advisory committee was at present considering these matters, and he hoped to have its report before the end of October

Workers in this field had been inspired by success in related fields Last year, for instance, recognition of the therapeutic value of the sulphanilamide compounds—including the well known M & B 693—opened up new vistas in the treatment of certain diseases that were the active concern of the health authorities These compounds had had marked success against puerperal fever, one of the main causes of maternal deaths, and there seemed to be good promise that in them a means of controlling the scourge of pneumonia had been found

The increase of £10,000 for the Highlands and Islands medical service brought the total under this head to £100,000—2½ times the original provision It was wanted mainly for assistance towards the cost of a new general hospital at Lerwick, Zetland, and additions to the general hospital at Stornoway in Lewis These two hospitals were essential links in the chain of medical services—doctors, nurses, hospitals, specialists, and so on—that now served admirably the Highlands and Islands of Scotland The air-ambulance service between the Western Isles and the *Renfrew* airport continued to prove a boon in urgent cases During 1938 over 30 patients were transported by air to hospital at Glasgow under the grant-assisted schemes of the county *councils of* Argyll and Inverness

About the hospital services of Scotland generally Colonel Colville said that there were still deficiencies, but schemes for repairing them were under way. These included a large new general and maternity hospital and a new fever hospital in Lanarkshire.

The number of persons coming within the scope of the national health insurance scheme increased in 1938 by nearly 200,000 and the expenditure on cash benefits per head declined from 4 *80d* in 1937 to 4 *10d* in 1938. The decline in that expenditure reflected a lower sickness rate, the average cost was the lowest since 1931 But influenza had been busy during the opening months of 1939, and sickness expenditure increased accordingly

A new scheme for milk at reduced prices to nursing an expectant mothers and children under five years of age had been started The intention of this scheme was that one pint of milk a day, free, or at a price not exceeding *2d* a pint, should be supplied He had brought this scheme to the notice of local authorities, and the reception had been favourable

Collections for Hospitals

In the House of Lords on July 4 Lord MACMILLAN moved an amendment to the Charitable Collections (Regulation) Bill, providing that where a police authority refused to grant a licence or revoked a licence which had been granted, the applicant or holder of the licence might appeal to the Home Secretary He said that it seemed ridiculous that a hospital, such as the Hospital for Sick Children in Great Ormond Street, which was supported by people in every part of England and many in Scotland, should have to obtain the authority of the police in every particular area where a collection was made For this hospital, which was to all intents and purposes a national charity, and for many other hospitals to have to get the necessary licences all over the country would be extremely hampering to their work.—The Marquess of ABERDEEN said that the joint committee had discussed the question of an appeal and had come to the conclusion that because of the difficulty of confining it to reputable cases of charity there ought to be no appeal The local police would know which were the reputable institutions in their district.—The amendment was withdrawn

Lord LUKE moved an amendment providing that the Home Secretary might exempt from the necessity of obtaining a police licence a person desirous of promoting collections for a voluntary hospital approved by the British Hospitals Association or by King Edward's Hospital Fund He said that the reason why the hospitals were not included in the favoured list of charities associated with the bill was because they did not beg nationally It was admitted that they served the community very well locally and in some instances did so throughout the country, but on the whole their service departments were usually better than their appeal sections, and the latter did not often reach from Land's End to John O'Groats In the past they had obtained support from an area, say, of 50 or even 100 miles around their hospitals, from which district they received the bulk of their patients, though in these days of motor accidents they might have patients from any part of the country Their area might include half a dozen, or even a dozen, police divisions and in each of these the favoured outside authorities would start with an advantage over the local hospital by having exemption The amendment would not put the local hospitals at the head of the favoured list of charities, it would only put them on a level and that after they had been thoroughly approved by one of the two central hospital bodies.—The Earl of COURTOWN said that the proposal would give undue advantage to a voluntary and non-elected association The application of a local hospital which did not belong to that association for a licence to make a collection might be regarded with some doubt by the police The joint committee had fully considered the matter and had decided that it was not necessary to include voluntary hospitals.—Viscount BRIDPORT said that the Government could not agree with the amendment The trouble involved in applying to several police authorities in cases where a hospital covered a wide area would not be great.—The amendment was negatived

The Milk Industry

In the House of Commons on June 29 Sir R DORMAN SMITH, Minister of Agriculture, presented the Milk Industry (No 2) Bill, a measure "to authorise certain payments out of the Exchequer to milk marketing boards in respect of certain milk, to extend the powers and vary the duties of such boards as to the making of payments or allowances to producers of milk and in connection with approved arrangements for the sale of milk at reduced prices, and as to the manner in which moneys paid to the boards from the Exchequer are to be dealt with, and to extend the functions of consumers' com-

mittees in relation to milk marketing schemes and milk product marketing schemes and milk product development schemes." The bill was read a first time.

QUESTION TIME

JUNE 28–JULY 5

Medical Examination of Militiamen

Mr. PARKER asked the Minister of Labour whether he could give any explanation of the great divergence between the results of medical examinations for the Regular Army, the Royal Air Force, and the Militia.—Mr ERNEST BROWN replied: The medical examinations for the regular forces have in view the requirements of the particular units in which the men wish to enlist, and cover a much wider age-range than that for the militia. Moreover, it is a common practice for an intending recruit who is rejected at one centre to try again at other centres or for other units and in this way the figure for rejections is to some degree inflated For these reasons the real divergence between the results for the regular forces and those for the militia is considerably less than that represented by the crude figures

Sir V. WARRENDER explained that in the event of a militiaman wishing to transfer to the Regular Army on completion of his service, he would again be medically examined to determine his fitness for the particular branch of the service to which he wished to transfer.

Answering three inquiries Mr ERNEST BROWN said he would have a copy of the instructions issued to the medical boards placed in the library.

Mr. MATHERS: Will it not be possible for more publicity to be given to these instructions?—Mr. BROWN The instructions are long and elaborate and have been drawn up with great care in consultation with a number of experts.

Dr. SUMMERSKILL asked whether a militiaman who had an unsatisfactory medical history and who was dissatisfied with the decision of the examining doctor was given the right to appeal for a second opinion from a specialist.—Mr. BROWN replied: The decisions of the medical boards are final, but arrangements are made for men to be referred to consultants for report when the boards are in doubt

Dr SUMMERSKILL: Is the right hon gentleman aware that many members on this side of the House have cases sent to them day after day of men who have been certified as suffering from a certain complaint but are now passed fit for service?—Mr BROWN: I hope that hon. members will send them on to me. The thing that has struck me for the last fortnight is the very small number of letters I have had on this matter

Physical Defects in Militiamen

Mr. JOHN MORGAN asked the Secretary of State for War if any special steps would be taken to remedy admitted physical defects in militiamen, accepted for other grades than grade I, while undergoing their period of military service.—Sir V. WARRENDER: Medical and surgical treatment will be available as for regular soldiers Minor physical defects will be noted on medical examination and by staff instructors in physical training. Those requiring remedial treatment by physical-training methods will be divided into groups according to their defects, and remedial treatment will be carried out under the supervision of staff instructors

Unemployed Persons and Physical Defects

Mr DAVID ADAMS asked the Minister of Labour how many men in receipt of Unemployment Assistance Board allowances were estimated to be unable to obtain work owing to remediable physical defects, and as treatment of eyes and teeth frequently could not be obtained through existing medical services he would take immediate steps, in conjunction with the Ministry of Health, to extend the public-health services in this direction.—Mr. ERNEST BROWN replied: I regret that more precise information than that given on pages 46–47 of the board's annual report for 1938 is not available I am already in communication with the Minister of Health on the matter raised in the second part of the question

Health Insurance Handbooks

Mr LOGAN asked the Minister of Health when he intended to issue an up-to-date consolidation of the National Health Insurance Acts; and if it was intended also to issue an approved societies' handbook.—Mr ELLIOT replied: I understand the reference in the first part of the question to be to the projected volume containing the consolidated National Health Insurance Acts and the regulations made thereunder. While some progress is being made in the preparation of this volume, and also of a revised edition of the Approved Societies' Handbook, pressure of other urgent work in my department has delayed their completion I hope that it may be found possible to issue the former volume within the next few months, but I am afraid that I cannot promise an early issue of the latter.

Expectant Mother's Choice of Doctor

Mr. GORDON MACDONALD asked the Minister of Health whether, as it was possible for circular 1705, sent out by his department, to so limit the choice of an expectant mother as to prevent her from having the services of her family doctor should she so desire, he would so modify the circular as to do away with such a hardship.—Mr BERNAYS replied: The circular does not impose or purport to impose such a limitation as is suggested in the question. The procedure suggested in the circular contemplates that ordinarily some practitioner on the list prepared by the local supervising authority will be acceptable to the expectant mother, but the circular makes it clear that where this is not the case and the expectant mother desires the services of some other duly qualified medical practitioner, this practitioner should be called in by the midwife.

Lancashire Advisory Committee

Mr. GORDON MACDONALD asked the Minister of Health the names of the advisory committee for the area of the Lancashire county council, set up in consequence of the same circular; and what consultations took place prior to the setting up of the committee.—Mr. BERNAYS replied: I am informed by the county council that the committee is composed as follows: Chairman: Dr Hall (C.M.O.) Obstetric consultants: Prof Leyland Robinson and Professor Dougal. General practitioners: Dr. Marsh and Dr. Winstanley Before making these appointments consultation took place, as suggested in the circular, with the organisations of medical practitioners which appeared to the county council effectively to represent the opinions of practitioners in the county. The President of the Royal College of Obstetricians and Gynæcologists was approached with regard to the appointment of the two obstetric consultants, and the general practitioners and their deputies were nominated for appointment by the Lancashire and Cheshire branch of the British Medical Association.

Rheumatism Eligible for Additional Benefit

Major CARVER asked the Minister of Health whether, in view of the serious incidence of rheumatism among insured persons, he would cause treatment at recognised British spas, given under medical recommendation, to rank for payment in whole or in part by approved societies where such were able to give additional benefit, No. 16, payment to approved charitable institutions in respect of any treatment of members required for the prevention or cure of disease provided under the third schedule of the National Health Insurance Act, 1936.—Mr. ELLIOT replied: I am prepared to consider the granting of approval for the purposes of additional benefit No 16 to any charitable institution which satisfies me that it has available diagnostic and other facilities of a high standard for the treatment of rheumatism I am not, however, at present satisfied that there is a sufficient case for the extension of the benefit to cover treatment at a spa otherwise than in an approved charitable institution

Ice-cream

Brigadier-General CLIFTON BROWN asked the Minister of Health whether he was aware that a considerable

amount of ice cream was made without cream or milk, and if he would bring in legislation to compel ice-cream makers to state the quantity and quality of milk used in ice creams they sold to the public—Mr ELLIOT replied I am aware that some frozen mixtures sold as ices or ice cream may contain little or no cream or milk. The Food and Drugs Act, 1938, which comes into operation on Oct 1, will give me increased powers for making regulations governing the composition of food and kindred matters, and I am considering the question of making regulations as to ice cream

Brigadier General BROWN Does not my right hon. friend think that the time has come when a statutory standard should apply to all ice cream sold; and will he make regulations to that effect?—Mr ELLIOT I will take these points into consideration

Sir PERCY HARRIS Have not the local authorities power to make by laws to regulate the sale of ice cream?—Mr ELLIOT I am not sure how far their powers go, but the new act will certainly give greater powers to the central department

Objection to Vaccination

Miss RATHBONE asked the Minister of Health whether he was aware that a statutory declaration of conscientious objection to vaccination made by the wife of a labourer in the Royal Arsenal, Woolwich, on behalf of her child, was recently refused by the vaccination officer of the Metropolitan borough of Woolwich on the ground that only the declaration of the father of the child could be accepted, he having its legal custody, that in this case the father was prevented from making a declaration owing to his hours of work being from 8 20 A.M. to 6 P.M., and that in many other cases the father might be prevented by illness, mental disability, or temporary absence from a home, and whether he would consider making such a change in the regulations as would enable the mother to make the declaration.—Mr ELLIOT replied My attention has not previously been drawn to this case The statutory declaration may be made before either a commissioner for oaths or a justice of the peace at any time I cannot, therefore, accept the contention that the father concerned was prevented from making such a declaration because of his hours of work I do not consider it necessary to propose the amendment of the law which the hon member suggests

Miss RATHBONE Is the right hon gentleman aware that this refusal to acknowledge the statutory declaration of the mother is not only practically inconvenient in many cases but is an insult to the mother and is quite inconsistent with the spirit of the declaration and of the Custody of children Act, and will not the Government consider taking action if necessary in the way of legislation to give equal rights to the father and mother in this matter?

Advertisements in Stamp Books

Sir FRANCIS FREMANTLE asked the Postmaster General if his attention had been drawn to two advertisements in current issues of 5s books of stamps, one headed trusses abolished, and the other claiming immediate results from an advertised remedy for bladder and other complaints, and whether he would take action to prevent Government publications from being used as a medium for such advertisements.—Mr MABANT, Assistant Postmaster General replied The policy of the Post Office is to exclude advertisements of medicines covered by paragraph 58 (2) of the report of the Select Committee on Patent Medicines 1914 The two advertisements referred to by my hon friend do not contravene the terms of this paragraph My right hon friend is looking further into the policy of the Post Office in this matter

Betting and Research

Replying to Sir THOMAS MOORE, Mr PEAKE, under-secretary, Home Office, stated that he was informed by the Racecourse Betting Control Board that from the surplus in the totalisator fund at Dec 31, 1938, £4500 had been allocated towards the advancement and encouragement of veterinary science and education The £1600 granted to the Agricultural Research Council towards the cost of investigation into the various diseases and disorders of horses would be applied in assisting inter alia research work at the Moredun Institution and the Royal (Dick) Veterinary College, Edinburgh £750 was granted to the building fund of the Royal (Dick) Veterinary College, Edinburgh £500 was granted to the Glasgow Veterinary College towards the cost of microscopes

MEDICAL NEWS

University of Liverpool

At recent examinations the following candidates were successful —

M D

A Ashworth, Phillis Dingle F Glyn Hughes N M Hancox, G L Hesketh, F T Madge and T H Pierce

C H M

H L Davies

FINAL EXAMINATION FOR M B, C H B

D M I Freeman (with first-class honours) R M Evans and Pearl Lyons (with second class honours)

Part III.—S Ball, A D Bracey Frances F Brierton R F Browne, W Coates, Florence M F Davies F T Downham, Margaret Edge T S Limerl S Ellenbogen H B Forrest, J A Gillet, C M Gregory, Harry Hall E L Hamm J Harkers T Heelley, Bessie Howarth H Ingham, G T Jenkins R R Knowles, A L Latner, F C Lawson, Anne L McCandlish, Sylvia Makin Hector F Martin F F Mason, R J Miller W H Millington, J D Muir, F Murtock, A G O Malley, Margaret Edge T S Limerl S Ellenbogen H B Forrest, R J Parry Margaret F Parry Edwards R Paul, Pleasor M Pearson, G Poole A G Porterfield, T Price, Kathleen Pugh-Jones W A Rogers C R Slumbe W O Spence, Lucy M Sutcliffe, Catherine S Thomas G O Thomas, Megan J Thomas Joan F Thomson J V Threlfall Olivia S Turner, J A Wethered, and A G Williams

Part II.—I Ansell S C Barnes H N C Bleasdale G J C Brittain D J Browne, Helen W Carmichael W F Christian Y Cookson A G Cowell Grace T Dawson D W Ellis Jones W I Ell H G Griffin, A H Hands J R Hannah Catherine W L Harries R Hermon J R Hughes, W J Hughes Jean G Huntley C Ibbotson C N Lind R R Immdgl I Levinson, Joan J Macara M G Metcalf A K Mitting J G Mott N B Nelles G V Osborne W H Partridge, W Rotherham, Kate L Rymer T A Sale C Slack, Beryl M Smith R A Smith F L Thomas F F Vaughan G R Wadsworth Hilda Walker, Kathleen M Walters Agnes M Williams Muir Williams, and F H Winterbottom

Part I.—Katharine F Ainsworth R V Allen G M Ardran Olive R Ballance Anita M Beck, W H Berry A K Bingham G J C Brittain, W P Clothier, R S Cook, J A Donnellan, C V Donnelly, J J Fanitt, D B Evans, Elizabeth S N Fenton R E D Flack H W Forshaw G L Gamble, N O R Gibbon, H Hall, J J Hargadon, J J Harris, S Horrocks J H Hughes, M W Hutchings Katie H Jones, Muir F Jones, N B Jones, W J Jones, Mary Jordan, A G Kirby, C A Kovachich, T E Lamb, D Leslie, T B McMurray, M Makin K J Mann, A Mansour, Lucy D Meyrick, J Moorhouse, J A B Nicholson, D F Norman C Partington, D J Peterson, H G Perry Hughes, G H Pimblett, Joan L M Potts A G Rickards F S Rickards, M Rosenthal W Rotheram G D Scarrow, G L Shatwell, J M Smithinbank W G Tanffe, W L Turner F Walker, Kathleen Walters G W Walton, D Whitaker, A S Whitehead J K Wilson J Winter and F J Zacharias

D M R T

Part II.—B M Maxwell and W Niven

D P H

Part I.—H D Collins and Margaret J Roberts

Part II.—J C Birchall C Coleiro, H D Collins, F C R Couper, J N Das Beryl Edgecombe, Ivy F Fallon Elsie G Hughes J Leiper F T Madge, F H Moore, and Mofia Murray

D T H

J M Caldwell, S G Cowper L G Fiddey, W H R Jamieson K Nadarajah and T S Outerbridge

On July 1 the honorary degree of master of orthopaedic surgery was conferred on Mr H V T Fairbank

University of Sheffield

On July 1 the honorary degree of D Sc was conferred on Dr Miles Phillips emeritus professor of obstetrics and gynaecology in the university

University of Manchester

Dr J N Marshall Chalmers has been appointed assistant director of the laboratory of clinical investigation and research

Dr. W. E. St. Lawrence Finny has been elected a vice-president of the British Archæological Association.

Volunteer Blood-donors

Those who wish to volunteer as blood-donors in wartime may obtain the address of the centre in their district and other particulars by telephoning Central 8691 between 9 30 A.M and 9 30 P.M

University of Bristol

At recent examinations the following candidates were successful :—

M D

Constance I Ham

FINAL EXAMINATION FOR M B , CH B

Dorothy M. Shotton and C A St. Hill (with second-class honours); Dorothy M Ayre, P A Bennett, A A. K. Datta, Marjorie O Dunster, J L Emery, Emily G Hamlyn, Betty F. Hannaford, F R Hurford, N E Melling, Jeannette D Shed, S J Silvey, P. R H Slade, Sylvia E Smith, and T H. White

FINAL EXAMINATION FOR B D S

G H Bell, J E H Bell, J. F Blenkinsop, R J Gething, A A Grant, and D R Stevens

FINAL EXAMINATION FOR L D S

K A Gordon-Ralph, G H Hudson, E. L. Manton, R H G Sims, Mary E Thomas, May A Trump, L N Weale, H D Williams, and E S Wolfson

In dental surgery, completing examination: F W. Clift.

Dr. Ernst Philipp has obtained the degree of M D.

Dr Hilda Dutton has been appointed medical officer for the examination of women students and Dr. R G. Cookson medical officer for the examination of men students

University of Edinburgh

In 1926 on the recommendation of a special committee which had been set up by the university court a department of physical training was started in the university Colonel Ronald Campbell was appointed director and was asked to organise and develop athletic activities and physical culture of the students It has now been decided to institute a certificate of physical ability for men students who undergo successfully a progressive course of training extending over two consecutive sessions. At present there is no similar graded course for women but it is stated that "attention will be turned to this at an early date"

Royal College of Surgeons of Edinburgh

At recent examinations the following candidates were successful .—

L D S

W. W Brown, W J M Gillies, T D Grandison, Michael Lipman, John Provan, Winifred G Sivewright, E F Stonehouse, A M Sutherland, William Walker, and William Waterston

University of Glasgow

On June 30 the following degrees were conferred —

M D—J D P Graham (with high commendation), J. A. Crocket and T R Pahwa * (with commendation), F W. Bunting, J M Henderson, Alexander Lyall, and A M Steel.

* In absentia

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on July 3, with Dr. John Henderson, the president, in the chair, the following were admitted to the fellowship .—

Habibud-Din Ahmed (London); William Ferguson Anderson (Whitecraigs), Tom Osborne Howie (Glasgow); Velu Pillai Kumara Pillai (India); Alfred Sands Rogen (Glasgow); Bhupendra Nath Sur (Edinburgh); and Abu Khaled Muhammad Abdul Wahed (Edinburgh)

University of Aberdeen

During the annual conference of the British Medical Association which is being held at Aberdeen from July 21 to 28, the honorary degree of LL D. will be conferred on the following :—

Dr H G Dain, chairman of the representative body of the association, Dr Thomas Fraser, president-elect of the association and consultant physician to the Aberdeen Royal Infirmary, Sir James Elliott, F R.A C S, honorary consultant surgeon to Wellington Hospital and editor of the *New Zealand Medical Journal*, and Dr Einar Meulengracht, professor of clinical medicine in the University of Copenhagen

The A W. Garden fellowship in ophthalmology and pathology has been awarded to Dr. D. F. Ritchie.

University of St. Andrews

On June 30 the following degrees and diplomas were conferred —

D Sc.—J D Robertson, M D

M.B , Ch B—B S Tulloch (with distinction), Winifred I MacNicol, A J M Cathro, W J McGinness, and Peter Kinnear (with commendation), R M Bell, J M Berry, J M Black, K G Broadbent, J. S Brunton, John Cameron, Elizabeth P Dodds, J. M. Duncan, A C Fraser, Elizabeth N Harrison, M C Hodgson, W F E Immelman, R. S Kennedy, R T Kiddie, Douglas Latto, H R Lillie, A R T Lundie, Elizabeth T MacDougall, E G McPherson, D J Macrae, Charles Milne, D S Milne, Freda C J Nicoll, R A Philp, D V. Porter, G H. Rea, G. W. Taylor, Kathleen S Turner, W H. Whyment, J S. Young, and John Young

B D S—I M B Allan, E A Haxton, R S Henderson, J L Hutton, and R P McGlynn

Diploma in Dental Surgery.—R. P Edwards, W R D Fraser, K G Galloway, D M Lawson, G M Lawson, G D McPherson, William Malcolm, and R R M. Wilson

D P H—W B Clark, C R Henderson, W M Jamieson, and William Sharpe.

Diploma in Public Dentistry—D. A. Henderson, Isabel S Powrie, W M Ross, and Robert Whyte

National University of Ireland

At recent examinations at University College, Cork, the following candidates were successful —

M D

V J. Dillon, William Kearney, J P. Morehan, and P F O'Connor

FINAL EXAMINATION FOR M B , B CH , B A O

M F McMahon and D J O'Callaghan (with first class honours), E A Scher, F H Cross, Madeline M Horgan, W F M. Fitzgerald, and M J Murphy (with second-class honours), G N Dalton, Anna T Gallagher, T G Galvin, D M Kelleher, Timothy Kelleher, Maev Kennedy, D J K McCarthy, P N Murphy, St J G O'Connell, T J O'Connor, J F O'Donovan, D A O'Sullivan, and Beatrice G Simmelkiar

Part I—T. F Coleman, J J. Hennessy, J. P Kenefick, M.S. Murphy, P. J Murphy, W P Navin, Mary L Neville, J S O'Dwyer, M G O'Mahony, John O'Regan, and P J O'Sullivan.

Part II—Matthew Bennett, J A Desmond, Diarmuid Herlihy, Thomas McCracken, and J A A Ryan

King's College, London

Dr D. B Taylor has been appointed lecturer in physiology at the college

French Decoration

The French government have conferred the order of palmes d'Officier d'Académie on Dr G. Gregory Kayne

Welsh National School of Medicine

Dr F R Magarey and Dr. H. D. Davies have been appointed demonstrators in the department of pathology and bacteriology Dr T. E D Beavan and Dr. Emily Williams have been appointed junior assistants in the medical unit.

Harveian Society of London

The summer meeting of this society will be held at the Associated British Picture Corporation, Elstree, on Saturday, July 15 Members of the society and their friends should meet inside the gate of the corporation between 2 45 and 3 P.M.

Social Hygiene Congress

The ninth Imperial Social Hygiene Congress will be held at B M A House, Tavistock Square, London, W.C.1, from July 10 to 14, under the presidency of Mr L S. Amery, M P Lord Horder will preside over a conference on social and economic barriers to marriage Dr Letitia Fairfield and Dr Socrates Noronha (Bombay) will speak in a discussion on medical and social coöperation; and Sir Arthur MacNalty will take the chair at a session devoted to technical, medical and administrative aspects of venereal disease at which Colonel L W. Harrison, M.B , and Dr. R. C L Batchelor will read papers Dr Ernest Prebble and Dr Gordon Bates, general director of the Health League of Canada, will discuss how to ascertain the incidence of venereal disease in a community An all day session will be given up to a conference on overseas nursing Dr A Cavaillon, inspector-general of the French ministry of public health, will read a paper on social service in the anti-venereal campaign Medical delegates are to visit the L C C Whitechapel clinic. Further information may be had from the secretary of the British Social Hygiene Council, Tavistock House South, Tavistock Square, London, W.C 1.

Vacancies

For further information refer to the advertisement columns

Barrow-in Furness —County borough deputy M O H and asst tuber O £350
Birmingham City —M O £500
Boodle General Hospital Liverpool —H P general H S, H S to spec depts, and cas O each at rate of £150
Bristol Royal Infirmary —Res med appts, at rate of £150–£80
Bristol Royal Infirmary and Bristol General Hosp —Two hon anæsthetists Also hon asst obstetrician
Burnley, Victoria Hosp —H P, at rate of £150
Cardiff King Edward VII Welsh National Memorial Association Res M O for Glan Ely Hosp £350
Cardiff Royal Infirmary —Hon asst physician
Coventry and Warwickshire Hosp —Res M O £300
Dewsbury County Borough —Deputy M O H and deputy school M O, £600
Dewsbury and District General Infirmary —Sen H S and second H S, £200 and £150 respectively
Dover, Royal Victoria Hosp —Second R M O, £140
East Ham Corporation —Asst M O H £300
East Ham Memorial Hosp, Shrewsbury Road, E 7 —Hon radiologist
Eastbourne Royal Eye Hosp Pevensey Road.—H S, at rate of £100 and £175
Essex County Council —District tuber officer £700
Essex County Council and Thurrock Urban District Council —Asst county M O H, £700 Also asst county M O H and asst M O H £500
Evelina Hosp for Sick Children, Southwark S E 1 —H S, at rate of £120
Glasgow Western Infirmary —Asst radiologist £100
Gravesend and North Kent Hosp —Jun H S at rate of £120
Grimsby and District Hosp —Res officers at rate of £225 to £150
Guildford Royal Surrey County Hosp —H S, at rate of £150
Hampstead General Hosp Haverstock Hill, N W 3 —H S and H P, each at rate of £100
Hosp for Tropical Diseases Gordon Street, W C 1 —Three H P's, each at rate of £120
Hounslow Hosp —H P and cas O at rate of £100
Hull Beverley Road Institution —Asst M O, £350
Hull Royal Infirmary —Second H P at rate of £150
Ilford King George Hosp —Res M O £150
Ipswich, East Suffolk and Ipswich Hosp —H S, and cas O, each £144
Kettering and District General Hosp —H P, at rate of £150
Kingston County Hosp, Wolverton Avenue —Res asst M O at rate of £250
Lancaster Royal Infirmary —Jun H S at rate of £130
Leeds Jewish Hosp 9 Leopold Street —Res M O £200
Leicester, City Isolation Hosp and Sanatorium Groby Road —Res M O at rate of £300
Liverpool Heart Hosp Oxford Street —H P, at rate of £100 Also clin assts
Liverpool School of Tropical Medicine —Lecturer in parasitology £700
London Chest Hosp Victoria Park E 2 —Med reg, £175
London County Council —Sen asst M O (grade II), £500 Asst M O's (class I), each £350 Also asst M O's (class II), each £300
London Hosp E 1 —Surgeon
London University —University readership in morbid anatomy, tenable at British Postgraduate Medical School, £800
Manchester, Christie Hosp and Holt Radium Institute Withington Sen and res surg O's, each at rate of £150
Manchester Langho Colony for Sane Epileptics —Med supt £1050
Manchester Park Hosp Davyhulme —Res surg O £300
Manchester Hosp for Consumption and Diseases of the Throat and Chest —Hon asst laryngologist
Manchester Royal Infirmary —Hon asst surgeon Jun asst M O in radiological dept, £350 Med chief asst, £300 Chief asst to surgical unit £250 Res surg O, £200 Also H P s and H S s each at rate of £50
Margate and District General Hosp —Res M O £150
Middlesbrough Poole Joint Sanatorium Nunthorpe —Med supt £900
National Hosp Queen Square W C 1 —H S £100
Nottingham City Mental Hosp —Sen asst M O, £580
Nottingham General Hosp —H P, at rate of £150
Paddington Metropolitan Borough —Temporary asst M O for air raid precautions services £500
Pontefract General Infirmary and Hyrdes Hosp —Sen res surg O, at rate of £175 to £200
Prescot Whiston County Hosp —Sen res M O, £100
Preston County Borough —Asst M O for maternity and child welfare, £500
Prestwich, near Manchester, County Mental Hosp —Asst M O, £550
Princess Elizabeth of York Hosp for Children Shadwell E 1 —Pathologist and surgeon
Redhill East Surrey Hosp —Sen H S, £150
Romford Oldchurch County Hosp —Asst res surgeon £350
Royal Cancer Hosp Fulham Road S W 3 —Res M O £200
Royal National Orthopædic Hosp 234, St Portland Street W 1 —Surg reg for country branch, £300 Also two H S s for country branch each at rate of £150
Royal Naval Dental Service —Dental officers
Royal Naval Medical Service —Medical officers
St Marylebone Hosp for Cancer and Other Diseases City Road E C 1 —H S at rate of £120
St Peter's Hosp for Stone, &c, Henrietta Street Covent Garden W C 2 —H S at rate of £75
Salisbury General Infirmary —H S at rate of £125
Sheffield Royal Infirmary and Hosp —Hon second dermatologist
Southampton County Borough.—Deputy M O H £720
Southend-on-Sea General Hosp —First H S, at rate of £100
Stafford Prestwood Sanatorium —Jun asst M O, at rate of £300
Sunderland, Children's Hosp —H P and H S, each at rate of £120
Taunton, Taunton and Somerset Hosp —H S, at rate of £125
Tavistock Clinic, Malet Place W C 1 —Training fellowship £150
Truro, Royal Cornwall Infirmary —H P, £120
Ventnor, Royal National Hosp for Consumption —Asst res M O at rate of £250
Walsall General Hosp —Res surg O, £300
West End Hosp for Nervous Diseases, Gloucester Gate, N W 1 —Two res H P's each £125

Medical Diary

July 10 to July 16

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1 Wimpole Street, W 1

TUESDAY

Psychiatry.—8.30 P.M. Dr C Killick Millard and Dr Letitia Fairfield Euthanasia and the Psychoses

ROYAL MEDICO PSYCHOLOGICAL ASSOCIATION

WEDNESDAY.—10 A.M. (Royal Pavilion, Brighton) annual meeting 2.30 P.M. Dr A Helen Boyle Watchman What of the Night? (Presidential address)

THURSDAY.—10 A.M. (Brighton County Borough Mental Hospital, Haywards Heath). Dr W J T Kimber Dr Lamorna Hingston Dr Twiston Davies Dr James Flind Dr Noel Harris Sir Hubert Bond Early Treatment for Mental and Nervous Disorders 2.30 P.M. Dr F A Carmichael, Mr G D Greville and Mr S G Tudor Jones Dr D J Watterson Symposium on Epilepsy

FRIDAY.—9.45 A.M. (Royal Pavilion) Dr A Meyer Mr W Grey Walter, Mr Norman Dott, and Prof F L Golla Symposium on Epilepsy 2.15 P.M. Dr J Taylor Box Dr G E Graves Peirce, Dr W McCartan and Dr J Carson Dr Guy Millman, Dr I Frost Symposium on Epilepsy (contd)

PADDINGTON MEDICAL SOCIETY

THURSDAY.—3 P.M. Visit to the Metropolitan Water Board, Kempton Park (Hanworth Road, Sunbury)

SOCIETY FOR THE STUDY OF INEBRIETY

TUESDAY.—4 P.M. (11, Chandos Street, W 1) Dr W Norwood East The Problem of Alcohol and Drug addiction in Relation to Crime

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road W 12

TUESDAY.—4.30 P.M. Sir Arthur Hall Meningitis and Acute Infections of the Central Nervous System

WEDNESDAY.—Noon clinical and pathological conference (medical) 3 P.M. clinical and pathological conference (surgical)

THURSDAY.—2.15 P.M. Dr Duncan White radiological demonstration 3.30 P.M. Dr A A Moncrieff Hygiene of the Newborn Child

FRIDAY.—2 P.M. clinical and pathological conference (obstetrics and gynæcology) 3.30 P.M. Mr J R Hume Hernia and Its Treatment

Daily, 10 A.M. to 4 P.M., medical clinics surgical clinics and operations, obstetrical and gynæcological clinics and operations

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W C 1

THURSDAY.—2 P.M. Dr Donald Paterson The Leukæmias 3 P.M. Dr R. Bonham-Carter The Early Recognition of Infectious Fevers

Outpatient clinics daily at 10 A.M. and ward visits at 2 P.M.

ST GEORGE'S HOSPITAL, S W 1

THURSDAY.—5 P.M. Dr Anthony Feiling neurological demonstration

WESTMINSTER HOSPITAL Horseferry Road S W 1

TUESDAY.—5 P.M. demonstration of cases of Findlay's disease and of cerebral tumour

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION 1 Wimpole Street W 1

MONDAY to SUNDAY.—ALL SAINTS HOSPITAL, Central Street S.E.11 afternoon course in urology.—LONDON CHEST HOSPITAL, Victoria Park E 2, sat and Sun course in diseases of the heart and lungs

SOUTH WESTLONDON POST-GRADUATE ASSOCIATION

WEDNESDAY.—4 P.M. (St James's Hospital Ousley Road, S W 12) Dr C J Lakin demonstration of medical cases

NOTES, COMMENTS, AND ABSTRACTS

MEDICAL ASPECTS OF THE NEW CHINA-BURMA ROUTE*

BY R. C. ROBERTSON, M C , M.D. Glasg , M.R.C.P.E , D.P.H.

HEAD OF THE DIVISION OF PATHOLOGY AND SCIENCES, LESTER INSTITUTE OF MEDICAL RESEARCH, SHANGHAI , COMMISSIONER, LEAGUE OF NATIONS ANTI-EPIDEMIC UNIT NO 2 FOR SERVICE IN CHINA

THE League of Nations Epidemic Commission to China has specially entrusted me with the task of surveying the region extending from Kunming to the Burma frontier with a view to elaborating remedial measures and to advising the Chinese government about the control of epidemics

The opening of the China-Burma highway marks a new epoch in means of communication in the Far East and is of interest to epidemiologists in that India and China will be in closer contact, with an increasing risk of the transfer of epidemic diseases from one country to the other. There is reason to believe that cholera has been carried over the mountainous border from Burma into Siam on several occasions and has swept down the valleys towards the sea. Plague has visited Yunnan province periodically during the past centuries, having been imported by caravans from Tibet or from Burma. In 1866 it ravaged Yunnanfu During the last few decades plague has been quiescent, but the province can easily be reinfected, especially now that motor transport is available Plague-infected rats might easily be carried in cargo coming into China by the new highway. The Chinese government is aware of this danger and is about to establish health stations at important points.

PRESENT STATE OF CHINESE TRADE ROUTES

The importance of this new entrance to China cannot be exaggerated in view of the present situation which has developed out of the Sino-Japanese hostilities. Many of China's trade routes have been strangled The lines of communication from the great seaports of Shanghai and Hong-Kong have been completely disrupted The worst blow followed the fall of Canton, when not only was Hong-Kong rendered impotent as a source of supply but the railway line from Canton to Hunan and the north was effectively blocked More important still, the great river systems with the West and Pearl rivers are no longer free to transport cargoes to Kwangtung and Kwangsi The Yangtze river is effectively blocked as a trade route from Shanghai to unoccupied China Even local traffic above Hankow is at a complete standstill owing to the fact that the junction with the Tung Ting lake and the Siang river is the scene of warfare This paralyses river communications with Hunan province Changsha, once one of the busiest ports in the interior, has been destroyed by fire and has no outlet by river There is still a railway from Changsha to Hengyang and thence to Kweilin in Kwangsi but no link with the coast and the outside world The fall of Nanchang has now cut off the Chekiang railway, by which the port of Wenchow could be reached by a circuitous route. The Japanese navy has rendered the ports of Kwangchowwan (Fort- Bayard) and Pakhoi useless as a means of entry to the country.

The only deep-sea port at present available for the unloading of cargoes for China is Haiphong, in French Indo-China The French railway from Haiphong to Yunnanfu is a metre-gauge line which passes over very mountainous country with severe gradients There is a very limited rolling stock, and the line can handle only a small fraction of China's wanted imports; it cannot even deal with the unloaded cargo now congesting Haiphong docks. The French, at the request of the Japanese, have ceased to allow munitions to be transported on this line into China There is no direct highway from French Indo-China to Yunnan province; the sole motor highway by which China can be reached is a narrow tortuous road entering Kwangsi province near Lungchow This road passes Nanning, which is not far from the coast and is liable to be interrupted by a landing at Pakhoi at any time. The Nanning route is chiefly used for motor-lorry transport and the importation of new motor vehicles The only other ways of bringing supplies into unoccupied China are by a northern route through Soviet Russia and by the new Burma-Yunnan highway.

NEW CHINESE HIGHWAY

The British have always realised that a railway from Burma through Yunnan to Szechwan would benefit imperial trade, and that the port of Rangoon could become the starting-point for a connexion between the two great waterways, the Irrawaddy and the Yangtze. The railway from Rangoon to Mandalay had been extended to Bhamo, on the Irrawaddy river, and to Lashio, not far from the Yunnan border, at the end of last century (see the accompanying map) The Chinese are now constructing the new railway which will eventually connect Lashio with Kunming. This railway misses some of the difficult country which a connexion with Bhamo would involve, but it has to cross the valleys of the Salween and Mekong rivers The natural obstacles are tremendous, and it will be several years before the railway is finished; but the highway has already been completed in a remarkably short time by 200 engineers and 160,000 men (mostly conscript labourers) and lorries carry munitions for China's defence along it daily.

The mortality among the workmen on this road was very great, especially during the construction of the Burmese sections from Lashio to Anting (see map) where the route passes through some of the worst malaria districts of the world. No accurate estimate of the ravages of malaria can be made, for no organised medical service existed during the construction of the highway The government highway bureau employed a few doctors during the autumn of 1938 and distributed quinine to the sufferers, but reports are still coming in of many fatalities, especially in the districts near Mongshih, where malignant tertian malaria is rife

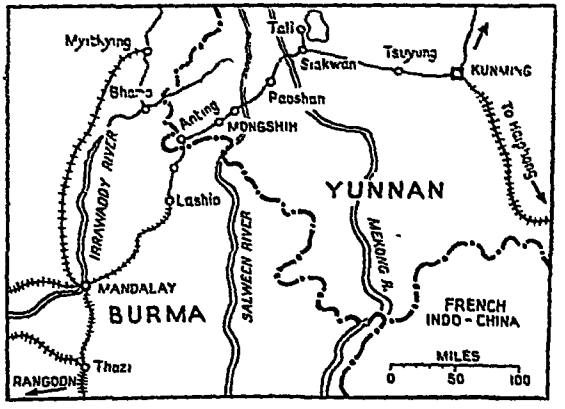
MALARIA IN YUNNAN

The valleys of the great rivers which flow southward through Yunnan province have always shown a heavy incidence of malignant malaria These rivers are the upper waters of the Red, Mekong, and Salween rivers Malaria is not so prevalent in the higher altitudes. Kunming is relatively free, except for a few months after the rainy season, when mosquitoes

* This paper has been abbreviated for publication, and a proof has not been submitted to the author

breed in temporary pools. During the greater part of the year the climate of the Yunnan Plateau is dry and not favourable to the breeding of mosquitoes.

A very different situation exists in the valleys towards the south and western parts of the province, where an annual rainfall of about 120 in. is common and malaria is endemic to a disastrous extent. It is very probable that within recent years the disease has become much worse owing to improved communications. For instance before the construction of the railway line from French Indo-China to Yunnan the city of Szemao in the southern part of the province was a flourishing centre with 160,000 inhabitants. Although this city is well away from the line and can only be reached by mule tracks or motor-car, it has been undoubtedly affected by the change of population during the last twenty years. Owing to the ravages of malaria the number of inhabitants has been reduced to 50,000. Many other centres have likewise been affected. The construction of the French railway is said to have taken a terrible toll of life the chief mortality being from *malaria*.



ANTI-MALARIA MEASURES

The chief danger of malaria along the new highway lies at present on the western portion of the route, where the disease is endemic among the inhabitants of all the towns and villages west of Paoshan (see map). Travellers along the highway, the drivers of the thousands of trucks which are beginning to use the road, are all exposed to infection if they stop in the villages, where up to now there is no sanitary control. The measures which are being instituted include the placing of mobile anti-malaria units supported by the League of Nations in the towns where malaria is endemic, intensive treatment of malaria patients with quinine, the supply of quinine as a prophylactic to travellers, the establishment by the National Health Administration of the Chinese government of general medical clinics, one to every 100 km., and the investigation of the local anophelines by the League of Nations Kunming Burma epidemiological survey unit.

In the immediate future it is hoped to improve the sanitation round hotels used by travellers, bus stations, and the local health-centres by drainage schemes and screening. To control malaria among the workers on the new railway it is hoped to establish anti-malaria clinics at the most useful points. Malaria cannot be controlled along this line with the efficiency with which it has been controlled in the Panama canal zone. The cost is prohibitive in China, and, to prevent a great wastage of human life, the funds must be supplied from outside China. The League of Nations is supplying quinine for the treatment of malaria patients in this region but much more is needed. Contributions of quinine from the governments of neighbouring and other countries would be a most useful way of helping to render healthier this important international trade route.

GOITRE

There is an extremely high incidence of goitre in Yunnan province together with obvious symptoms of cretinism, especially along the new highway. In some gangs of men and women working on the road the incidence of goitre is 60 per cent. It is not noticed in the children.

It is generally admitted that the addition of iodine to the diet even in very small quantities is sufficient to prevent further development of this condition but iodine is very deficient in these parts, not only in the salt but also in the vegetation. This is probably due to the geological conditions of the area for the salt which comes from the Yunnan mines is deficient in iodine. This is not the case with the mines of Szechwan. Normally some 70 per cent. of the salt needs of China are supplied with sea salt, which contains an adequate amount of iodine. The Japanese military occupation has cut off the hinterland of China from its coastal supply, and the deprivation of the normal sources of salt is one of the greatest hardships. To make up for this cutting off of the normal supply of sea salt the salt wells of China are being increasingly exploited and can probably supply the amount of sodium chloride needed but not a sufficiency of iodine.

Large areas of unoccupied China are now being supplied with this iodine free salt from the Yunnan mines, and the consequences of a deficiency of iodine are bound to become manifest particularly if hostilities are prolonged. In Yunnan province the typical area of production is the Hoching salt wells, where the brine is pumped out through bamboo pipes to vats and there boiled down. This has up to now been very largely a "cottage industry." The vats are in small houses, and each family controls and operates only a few vats. The output however, is carefully recorded by the Salt Administration. The salt crystallised is then transported to the main market in Kunming. The output from this district amounts to some 7530 tons a year. To provide adequate iodine content in the salt requires the addition of about 5 mg. of potassium or sodium iodide to each kg. of common salt.

Another way of supplying enough iodine in the ordinary diet is to use edible seaweed. The iodine in seaweed is said to be a hundred times more active than in potassium iodide. The daily need is less than 0·01 mg. of iodine a head (von Fellenberg's estimate

is only 0·014 mg.) It is recommended that a small amount of edible seaweed (about 10 g.) should be included in the diet twice a month At the moment it is very difficult to import seaweed to the goitre districts, but some of it reaches Kunming by the Indo-China railway. The inhabitants of Kunming are not heavily affected by endemic goitre, although the villages in the surrounding districts produce many sufferers.

While the question of supplementing the crude native salt with iodides is being considered, immediate steps have been taken to give a weekly dose of 1–2 mg of iodine in the form of potassium iodide to school-children and students in universities and other institutions where the personnel is under control or discipline It remains to be seen if, in the absence of preventive measures, the immigrants recently arrived from other provinces or from the war-stricken zones will acquire enlarged thyroids when they reside in goitre districts

OPIUM

The smoking of opium is very prevalent in Yunnan, where the drug is cheap and easily obtained Moderate addicts do not seem to have their health noticeably affected The question of control is at the moment outside the scope of the practical sanitarian. One can but hope that in due course the government will take the matter up energetically as in other provinces, particularly Kwangsi, during past years Yunnan may be said to have long been one of the neglected provinces in social reform in modern China It is only since the war that it has come into the limelight There can be now no turning back, for Yunnan is, and promises to remain, the most important province of western China; it is no longer the backdoor to China but is destined to play an increasingly important part in her trade with Britain and other foreign countries

A HOSPITAL SHIP

THE Spanish troops who lately took refuge in France included 12,000 wounded, for whom the local resources of hospitals, material, and personnel were insufficient The French government accordingly converted two steamships into hospital ships and sent them to Port Vendres. Marcel Arnaud, who was appointed chief surgeon to the larger of these two ships, the *Maréchal Lyautey*, described his experiences to the French Academy of Medicine on May 16 (*Bull Acad. Méd. Paris*, 1939, 121, 671). During her month's stay at Port Vendres the *Maréchal Lyautey* dealt with over 1500 Spanish wounded, having 1200 on board at once. She also treated about 300 out-patients from the town There were, Arnaud says, 1080 beds, with palliasses and bedclothes, in four well-ventilated holds furnished with lavatories and water-closets. The second-class and third-class cabins, each with four or five beds, were reserved for the more seriously wounded and for those who had just been operated on There were five operating-theatres: three for septic cases; one for clean cases; and one for plasters One of them was also used as a dressing-station, and there were five other dressing-stations, four of them being in the holds. Two ambulances were used for evacuating the patients, a lorry for carrying supplies, and a car for the chief physician. There were five surgical teams, each consisting of a surgeon and two assistants, and a medical team of three physicians, of whom one acted as radiologist. Besides these the ship carried a dispenser, and another surgeon who specialised in treating fractures of the mandible. The forty French red-cross nurses were later joined by three Spanish nurses Arnaud adversely criticises their floating head-dress, which was very inconvenient when dressing a wounded man lying on the ground, was always getting caught up in wards crowded with beds, and was dangerous in the operating-theatre. He also suggests that it should be compulsory for every one of them to carry, as part of her uniform, a stout pair of scissors for cutting bandages.

Forty of the least severely wounded Spaniards were pressed into service as interpreters, stretcher-bearers, additional nurses, and in different fatigue-duties One of them became assistant to the radiologist, another acted as masseur, and others were donors of blood Apart from numerous radioscopic examinations, over 200 radiograms were made with the help of portable apparatus. Major operations averaged 6 a day; 800 plasters were removed and only 66 put on—a fact which possibly illustrates the difference between French and Spanish ideas of dealing with war wounds. There was only one case of gas-gangrene; it had come from another hospital. There was no tetanus and no death due to anæsthetic. The deaths totalled 11, of which 9 were in cases of severe wounds previously operated on in another hospital, 1 was from cerebral hæmorrhage in a man whose wound had healed and who was ready for evacuation, and the remaining 1 was from uræmic coma in a man four days after he had had a fracture reduced on board.

All the patients except those whose wounds needed immediate attention were deloused as soon as they arrived. This was done on the after-deck. Their clothes were sent to the steam disinfector on board. After this process many of the wounded were left completely naked, for their clothes were so dirty and so ragged that very few of them could be used after disinfection and despite repeated requests it took three weeks to obtain shirts, trousers, and sandals in sufficient quantity to clothe them again. This was a striking contrast to the supply of medical and surgical material. With only two days' notice it was possible to equip four operating-theatres, and the complaint was made that too much material had been sent.

EPIDEMIC DIARRHŒA OF THE NEWBORN

DURING the years 1926–36 there was in New York city a steady decline in the death-rate of the older group of infants but only a very slight decrease in the neonatal period. The rate in infants from one month to one year old dropped from 35 5 to 17 8 per 1000 live births, whereas that in infants from birth to one month decreased only from 32 3 to 27·7. Although the neonatal deaths were no doubt partly due to birth injury, congenital malformations and prematurity, S. Frant and H. Abrahamson (*N Y. St. J. Med* 1939, 39, 784) urge that the important part played by infections, especially diarrhœal diseases, as a cause of illness and death has not been sufficiently emphasised. In 27 outbreaks of infantile diarrhœa in New York city between July, 1934, and December, 1937, the total number of exposed live-born babies was 5082, of whom 750 were attacked and 356 died, the mortality being 47 per cent. There was no instance of the disease spreading to older children or adults. Sex or race did not affect the incidence, nor was there any significant difference between artificially fed and breast-fed infants. The highest percentages of morbidity and mortality were found in the winter months. Bacteriological examination of the nasopharyngeal secretions and of the stools, and agglutination tests of the blood were consistently negative.

During November, 1937, a disastrous epidemic of infectious diarrhœa broke out in the Memorial Hospital at Worcester, Massachusetts. According to A. M. Kimberly (*New Engl. J. Med.* April 20, 1939, p. 664) the infection could be traced to an infant discharged from a hospital in New York city, and the clinical pictures of the babies at Worcester were identical with those in New York. Of the six babies affected five were in hospital for prematurity or feeding difficulties and were grossly underweight, and

all these five died Nearly all the babies acquired some kind of respiratory infection before death, but the post-mortem findings in the gastro-intestinal tract were slight The predominant organism in the stools was *Bacillus welchii*, which was not regarded as significant, and Kimberly suggests that the primary cause was a virus

TOTAL ŒSOPHAGOPLASTY

THE radiological appearances of an œsophagoplasty performed some six or seven years previously are described by P L Fariñas in *Vida Nueva* (April 15, 1939, p 194) The original operation had been done by D Fernández, who reported the case to the Pan-American Medical Association in January, 1938 It was done in three stages in the first a jejunostomy was made in the third left intercostal space close to the sternum, together with an anastomosis between the stomach and the jejunum and another between the upper and the lower parts of the jejunum, two months later the upper part of the œsophagus was used to form an œsophagostomy 3 cm above the clavicle, and in the third stage an artificial œsophagus of skin was constructed to connect the œsophagostomy with the jejunostomy With the aid of radio-opaque liquids and pastes Fariñas studied the action of this artificial œsophagus and observed considerable dilatation of the cervical (true) œsophagus and a circular stenosis where the artificial gullet began The meal was passed by strong contractions of the cervical œsophagus into the artificial, where it caused some distension owing to the partial resistance to its further progress Later, when the whole of the artificial œsophagus was filled it was dilated uniformly except in its terminal portion Here there was a slight kink *where the artificial* œsophagus joined the jejunum, and just proximal to it there was further dilatation or even ectasia The cutaneous portion of the tube, after the meal had passed through it, remained distended with air which had been swallowed The meal passed through the jejunal portion to the stomach in the same way as it does through a normal jejunum and was subjected to segmentation by the action of the valvulæ conniventes Some of the meal entered the stomach and some passed through the remainder of the jejunum Fariñas concludes that the patient's artificial œsophagus works perfectly

DUM-DUMS UNDER X RAYS

IN any war the other side always uses dum-dum bullets, and on the slightest pretext a protest is made, as though their use were a very serious infringement of the rules of "civilised" warfare As we have previously pointed out (*Lancet*, 1936, 1, 1309), an ordinary rifle bullet sheathed with nickel and fired at less than 200 yards' distance, with a muzzle velocity of over 2300 ft per sec, causes a large ragged wound of entry, because of the terrific force of impact and because it wobbles in the earlier part of its flight Ignorance of this fact often leads to the accusation that dum-dum bullets have been used On the other hand, a soft-nosed bullet, in which the sheath is not continued to the tip, is used in elephant-guns for killing big game, it is not meant to pass through the animal's body but to stop the beast with a violent blow. Thus the effect of a dum-dum bullet can be produced by a standard bullet fired at short range with a high velocity rifle, or by a soft leaden bullet fired with a low-velocity firearm Further, a hard sheathed bullet can be "dum-dumised" by partly stripping off its sheath

A Grilli has attempted to distinguish these different types of missiles radiographically, both from his experiments on wooden planks and from human material examined in the military hospital for native troops at *Asmara* during the Abyssinian war and the subsequent "police operations" (*Quad di Radiol* 1938, n s 3, 114) He recognises that it is very difficult to decide from the appearance of a wound whether it was due to a dum dum bullet, because a similar effect can be produced by an ordinary bullet fired at close range or by a ricochet The same remark applies to a wound caused by an explosive bullet (which Grilli accuses the Austrians of being the first to introduce in the Great War) Even radiographically no distinction can be made between true dum-dum—i.e, soft-nosed—and "dum-dumised" bullets, both undergo much deformation and litter the wound track with particles of the metal sheath On the other hand, radiography distinguishes clearly between standard sheathed bullets and those with a partial sheath or none If the bullet has not struck a bone, it can sometimes be identified by its shape, calibre, length, and deformation and it is possible to say whether it is a ricochet Regulation bullets sometimes leave metallic particles of the sheath, which of necessity does not cover the base of the bullet and so can be stripped upwards and broken off Deformation of a bullet in a wound is not always clear evidence, because it may have struck something else before entering, but a naked bullet (without a sheath) becomes deformed in a typical way during its trajectory and can be recognised by flattening of the nose and expansion of the base

TANGANYIKA ARROW POISONS

THE use of poisoned arrows by the Ethiopians was described by Theophrastus in the fourth century B C., and there have been intermittent references to these lethal weapons in the writings of Portuguese and other Europeans visiting Africa ever since Their main use now is in killing game, but they are still of medicolegal interest in parts of East and Central Africa, and according to W D Raymond (*E Afr med J*, March, 1939, p 419) 7 out of 39 post-mortem examinations done lately in the Musoma district have revealed evidence of their homicidal use

The arrows are some 3–5 in long, with an iron tip wrapped with a vegetable material soaked in the poison In 1888 Arnauld isolated from Somali arrows a toxic principle which he named ouabain, prepared from *Acokanthera ouabaio*, and Raymond has found that most of the poisoned arrows in Tanganyika are tipped with preparations of one of the three indigenous acocanthera, though some carry extracts obtained from *Strophanthus emini*, or from local varieties of adenium, scilla, or urginea All of these contain glucosides with a cardiac action similar to that of strophanthin, and it is remarkable evidence of the accuracy of observation of these tribes that they have utilised almost all the known indigenous cardiac glucosides in this way Raymond has found some arrows carrying enough poison to kill 250 men, and he says that in human subjects death usually follows a wound in from twenty minutes to two hours There are no characteristic post-mortem findings in arrow poisoning, but some African chiefs say they can recognise it by the appearance of the skin

INTESTINAL OBSTRUCTION BY IMPACTED FOOD

A CURIOUS case of acute intestinal obstruction is described by H J Postel (*Ned Tydschr Geneesk* 1939, 83, 1959)

The patient, a man of 72, walked into the surgery at 9 o'clock at night, complaining of acute abdominal colic He had taken a meal at noon, consisting only of mashed potatoes Three hours later he had vomited, and colicky pain had begun, at first in the epigastrium and later all over the abdomen The bowels had acted two hours after the onset of the pain, but the patient noticed that no flatus was passed Before the attack he had been in good health Physical examination revealed nothing but slight distension of the central part of the abdomen A mild sedative was prescribed and the patient sent home to bed

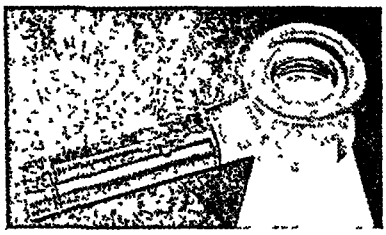
Next morning he was no better, and complained of nausea. The tongue was dry and coated and the abdominal distension had increased He was therefore sent to

hospital for operation. This disclosed a soft mass impacted in the small intestine about 12 in. above the ileocæcal valve, with considerable distension of the bowel above it. The foreign body was removed and turned out to be a piece of dried apple which had swollen after ingestion so as to obstruct the bowel The patient on being questioned recollected that he had eaten a few rings of dried apple, which for lack of teeth he had been unable to chew properly

The patient recovered from the operation, but a fortnight later had a pulmonary embolus and died.

AN ILLUMINATED MAGNIFIER

THE "Partington" illuminated magnifier illustrated here is intended to supply a good light and a moderate degree of magnification for examining or carrying out minor manipulations on the skin or elsewhere. It is some 7½ in. long and consists of a white bakelite head and a metal handle. The head contains a lens system giving a magnification of 10 and a small electric lamp supplied by a dry battery in the handle. When the instrument is placed flat on the skin its surface is accurately in focus, and there is no distortion even at the extreme edge of the field. An aperture at the side of the head allows a forceps or scalpel to be used under full observation.



The magnifier can be obtained from any instrument-maker, price 27*s.* 6*d.*, and it should find many uses in the consulting-room. A more powerful model is now being developed which will give a much higher magnification for eye work and the like.

BACTERIOLOGY WITHOUT TEARS

IN his "Man Against Microbe" (London: English Universities Press. 1939. Pp. 304. 7*s.* 6*d.*) Prof. J. W. Bigger, of Trinity College, Dublin, has tried to present the subject of bacteriology to the intelligent layman in a comprehensive and attractive form, and he has undoubtedly succeeded. In the first section he explains what microbes are, how they are studied and identified by microscopic and cultural methods, their importance in nature and their rôle in the production of disease. In the last two chapters in this section he shows how the animal body attempts to cope with invaders and outlines the methods used in studying the defence mechanism of the body. In the second section Professor Bigger describes the historical development of our knowledge of bacteria and their relation to disease, and in the final section the ways in which disease is contracted and spread amongst men and animals. To the lay reader the first section may seem rather heavy going, and though the descriptions of technical methods that it contains are accurate and clear some of them might well have been omitted The rest of the book makes up for the pedestrian beginning by being full of interest, though there is no tendency to dramatise a subject which needs no such treatment. Incidentally the book indicates clearly the rationale and value of our present measures of specific treatment and prophylaxis against microbic diseases, and should impress on the reader the rapid advances in knowledge that have been made possible by animal experiment.

BRITISH THUNDERSTORM SURVEY.—Dr. F. R. Humphreys has undertaken on behalf of the Thunderstorm Census Organisation to collect information about causes of injury by lightning or electric current to human beings. He would be grateful for help in obtaining particulars of personal injuries sustained He states that "no publicity will be given to individual cases, and the information will only be used for scientific record." Copies of the questionnaire which Dr. Humphreys has drawn up may be had from him at 15, Denton Road, Wokingham, Berks.

Appointments

BRISCOE-SMITH, J. H., M.B. Birm., temporary assistant medical officer for St. Pancras.

CLARK, W. B., M.B. St. And., D.P.H., assistant medical officer of health for Newport, Mon

CRUICKSHANK, ALEXANDER, M.B. Aberd., F.R.C.S., assistant surgeon to the Queen's Hospital for Children, London.

DORRELL, E. W., M.B. Camb., F.R.C.S., assistant resident medical officer at the City of London Maternity Hospital

EVANS, ABEL, M.B. Lond., M.R.C.P., hon. physician to the Cardiff Royal Infirmary.

GABB, W. H., M.B. Camb., M.R.C.P., medical officer at the Chelsea Hospital for Women's convalescent home, St. Leonards-on-Sea

GARMANY, GERALD, M.B. Manc., resident assistant medical officer at Crumpsall Hospital, Manchester

HARDMAN, JAMES, M.B. Birm., F.R.C.S., neurological surgeon to the Royal Sheffield Infirmary and Hospital.

LILLIE, D. C., M.B. Glasg., resident assistant medical officer at Crumpsall Hospital, Manchester

OAKLEY, W. G., M.D. Camb., M.R.C.P., assistant physician to the diabetic department, King's College Hospital, London.

SUMMERHILL, J. H. E., M.R.C.S., resident medical officer at the City of London Maternity Hospital

WITHERS, R. J. W., M.D., M.Ch. Belf., F.R.C.S.E., orthopædic registrar to the Royal Victoria Hospital, Belfast

Births, Marriages and Deaths

BIRTHS

BLEWITT.—On June 30, at the Maternity Hospital, Liverpool, the wife of Captain Basil Blewitt, R.A.M.C.—a daughter

BULLEID.—On July 2, the wife of Dr. A. H. Bulleid, of Midsomer Norton—a son.

CRAIG.—On June 25, at Framlingham, the wife of Dr. D. M. Craig—a daughter

FREW.—On June 29, at Stafford, the wife of Dr. John Frew—a daughter

GREIG.—On June 19, at the Westminster Hospital, the wife of Dr. M. T. Greig—a son

HOUGHTON.—On June 28, at Solihull, the wife of Dr. A. C. Houghton—a daughter

NEWMAN.—On June 30, the wife of Dr. James Newman, of Chichester—a son

NUSSEY.—On June 30, at Bournville, Birmingham the wife of Dr. A. M. Nussey—a daughter

SMITH.—On June 5, in Poona, the wife of Captain Michael Smith, I.M.S.—a son

MARRIAGES

BROWN—BASH.—On July 1, at St. Mary's, Ealing, Arthur Ivor Parry Brown, M.B., to Joyce Marion Bash.

NESFIELD—HIGGINS.—On June 24, at St. Mark's Church, Purley, John Clive Baird Nesfield, L.M.S.S.A., to Stella Mary Higgins

DEATHS

FELDMAN.—On July 2, in London, William Moses Feldman, M.D. Lond., F.R.C.P., F.R.S.E., aged 58

RAFFAN.—On June 28, at Huddersfield, James Raffan, M.D. Aberd., F.R.C.S.E., D.M.R.E., in his 56th year

RANKING.—On July 4, Robert Maurice Ranking, M.D. Camb., M.R.C.P., of Tunbridge Wells, aged 63

WATSON.—On June 27, at Harrogate, William Muir Crawford Watson, M.D. Edin., aged 72

*N.B.—A fee of 7*s.* 6*d.* is charged for the announcement of Births, Marriages, and Deaths*

NUTRITION AND THE PUBLIC HEALTH.—The proceedings of the National Conference on the Wider Aspects of Nutrition held by the British Medical Association last April have now been published under this title Copies of the book (2*s.* 6*d* post free) can be obtained from the association, B.M.A. House, Tavistock Square, London, W.C.1

ADDRESSES AND ORIGINAL ARTICLES

SURGICAL TREATMENT OF ARTERIAL HYPERTENSION*

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HIGH blood-pressure is the commonest cause of death in the second half of life After fifty 1 death in 4 is due to arterial hypertension or its consequences [1] [2] In a series of 82 cases of arterial hypertension studied post mortem by Fishberg [3] 72 were "essential" and only 10 nephritic By essential hypertension he means all cases of chronic hypertension without clinical or anatomical evidence of antecedent renal disease The average age at death due to essential hypertension is fifty five In a group of 420 hypertensive patients death was due in some 60 per cent to cardiac failure, 20 per cent to cerebral accidents, and less than 10 per cent to renal failure [4] The large majority of patients with arterial hypertension die relatively early owing to mechanical strain on the heart and arteries It has been widely maintained that arterial hypertension is a compensatory mechanism designed to improve the circulation to the tissues generally or to a particular organ that requires extra oxygen and nutriment, and on this account a laissez-faire attitude has been adopted towards the treatment of high blood pressure This attitude is encouraged by the observation that chronic hypertensives often feel worse when their blood pressure falls, but the commonest cause of a falling blood pressure in arterial hypertension is failure of the left ventricle, which can by no means be regarded as beneficial.

It is well known that cardiac output is seldom increased in hypertension,[29] pressure being maintained by generalised increase in the peripheral resistance due to narrowing of the arterioles Since capillary pressure approximates to normal,[17] at all events in most of the body, and since metabolic exchanges take place in the capillary bed and not in the arterioles, it follows that the needs of the tissues for oxygen are no better served in the hypertensive than in a person with a normally adjusted circulation Though we are certain that the general efficiency of the circulation is not improved by high arterial pressure, the question of selective circulatory increase cannot be so readily answered It is easy to accept the idea that changes in an organ or tissue whose function is impaired directly by disease or indirectly by reduction of its normal quota of blood may induce an increase in the arterial pressure, with the result that extra blood is shunted towards it The organ that has attracted greatest attention from this point of view is the kidney, which is unique in requiring something more than an adequate rate of blood flow for its proper function A considerable head of pressure in the afferent glomerular arterioles is vital, the average being about 100 mm Hg, and, when the pressure falls below 40 mm Hg, filtration through Bowman's capsule ceases Many accept the theory that hypertension in renal disease is simply an attempt on the part of the body to improve the renal circulation However attractive this teleological reasoning in nephritic hypertension, it cannot readily be applied to essential hypertension, which is ten times commoner Further, those who believe that hypertension is a beneficial compensatory mechanism must admit that the cure is worse than the disease, for 80 per cent of hypertensives die as a direct result of cardiovascular strain, whereas less than 10 per cent succumb to renal failure

The position as regards hypertension may be summarised thus —

(1) There is no increase in general circulatory efficiency There may or may not be increased circulatory efficiency in some particular organ, In other words, hypertension is probably not a beneficial adjustment

(2) Death usually takes place as a direct result of raised blood-pressure

It therefore appears that there is no fundamental objection to methods designed to reduce the blood-pressure in essential hypertension and perhaps in other kinds of arterial hypertension

Factors Controlling Blood-pressure

Before describing the forms of surgical treatment that have been advocated, it is necessary to consider shortly how the blood pressure is regulated in normal circumstances, and how the regulatory mechanism is perverted in essential hypertension Arterial pressure is directly proportional to the product of the cardiac output and the peripheral resistance In essential hypertension and the hypertension of chronic nephritis cardiac output is not raised [29], consequently the rise in pressure is due to increased peripheral resistance, which in turn depends on the calibre of the vessels and on the viscosity of the blood In essential hypertension and the hypertension of chronic nephritis viscosity and the volume of the circulating blood are substantially unaltered [30], hence the only effective factor in increasing peripheral resistance must be narrowing of the blood vessels The lumen of a blood vessel may be reduced by a change in the structure of its wall or by active contraction of its muscular coat Gull and Sutton [31] believed that endarteritis and thickening of the intima, or sclerosis of the media, in the arterioles and capillaries were the cause of hypertension in chronic Bright's disease, but true generalised arterio sclerosis does not exist in association with nephritis, still less with essential hypertension, in fact, as Fishberg [3] says, all available evidence points decisively in the opposite direction—i e, that the hypertension causes such arteriolar lesions as are found † Hypertension, both essential and nephritic, must therefore be due to active contraction of the muscular coats of the arterioles The factors which may directly influence vasomotor tone are either nervous or chemical

NERVOUS FACTORS

Stimulation of vasomotor nerves is known to increase blood pressure, and the notion that vaso-constriction of nervous origin is responsible for arterial hypertension is attractive alike for its simplicity and because it suggests a means of surgical attack But such arguments must not be accepted uncritically More than one surgeon has been duped by scientific confidence tricks of this kind and has become an indiscriminating destroyer of portions of the sympathetic system, to the lasting injury of

* Hunterian lecture delivered at the Royal College of Surgeons on June 2 1938

† The histological evidence of Moritz and Oldt [32] however suggests that renal arteriosclerosis is the primary lesion in essential hypertension

this branch of therapeutics. In 1936 two papers of great importance appeared: Pickering [48] and Prinzmetal and Wilson [55] independently and by different techniques have shown that the pressor agent in essential hypertension and hypertension of chronic nephritis is not nervous The methods consisted essentially of measuring the blood flow in the arms of hypertensives after cutting off all vasomotor impulses thereto. If hypertension is due to nervous constrictor impulses, their removal from a small area of the vascular bed, such as the arm vessels, will cause an abnormal increase in blood flow. This does not, in fact, take place; hence it follows that the abnormal vascular tone is not nervous, at all events in the arm and peripheral circulation generally, although, as Pickering is careful to note, this does not necessarily apply to all internal organs. It is possible to produce hypertension in animals by injecting kaolin into the cisterna magna or by denervating the carotid sinus and dividing the depressor nerves, and it has been suggested that human essential hypertension is due to ischæmia of the medulla oblongata or to disorder of the carotid sinus and aortic reflexes, leading to excessive vasoconstrictor impulses. The observations recorded above dispose of both hypotheses (see also Bouckaert et al.[7] and Pickering et al.[51]).

CHEMICAL FACTORS

Adrenaline.—The powerful pressor action of adrenaline, so often called into play under physiological conditions, renders this substance suspect as a predominating cause of essential hypertension. The opposing evidence is so weighty, however, that it will suffice to summarise it to shatter what Janeway [37] has called "the beautiful dream of adrenalinæmia."

(1) Using a test capable of detecting adrenaline in a dilution of 1 in 700 million, Hülse [35] examined the blood of hypertensives and found no trace. This has been confirmed by Rogoff and Marcus.[56]

(2) Minute doses of adrenaline dilate rather than constrict blood-vessels.

(3) Pressor doses of adrenaline reduce the peripheral blood flow. This is unaltered in essential hypertension.

(4) Pickering and Kissin [50] find that patients with essential hypertension or chronic nephritis are not unduly sensitive to adrenaline.

(5) The rare instances of paroxysmal hypertension known to be due to tumours of the suprarenal medulla do not resemble essential hypertension and are promptly cured by removal of the tumour.

(6) Denervation of the suprarenals, with or without destruction of the medullary tissue, does not substantially reduce the pressure in essential hypertension.[21 27]

Suprarenal cortex.—Tumours of the suprarenal cortex occasionally appear to be the cause of paroxysmal hypertension, and hyperplasia of the cortex has been observed in essential hypertension, especially when associated with Cushing's syndrome. Such hyperplasia is, however, more often absent in hypertension and often present when the blood-pressure is normal, and there appears to be no reason to regard the average case of essential hypertension as due to disorder of the suprarenal cortex.

Pituitary.—In 1932 Cushing [15] drew attention to a peculiar condition, now known by his name, in which a basophil adenoma of the pituitary gland is associated with hypertension and certain striking bodily changes Cushing put forward the theory that an excessive secretion of the pressor principle of the posterior lobe of the pituitary was responsible for the hypertension. This theory has been extended to serve as a possible explanation of the raised pressure in essential hypertension; but, before it can be accepted as an explanation of the average case, it remains for this pressor principle to be demonstrated in the blood or in the cerebrospinal fluid of essential hypertensives Further, the clinical features of Cushing's syndrome are so dramatic that one cannot accept too close a comparison with ordinary cases of high blood-pressure. It must, however, be admitted that this is no argument against the raised blood-pressure being due to the same cause in both types of case. Page and Sweet [46] have shown that hypophysectomy in dogs with experimental renal hypertension often reduces the blood-pressure to the normal level, but they believe the effect to be indirect and not due to removal of the pressor principle of the posterior lobe of the pituitary. It is possible that the pituitary gland may play a part in the form of hypertension known as climacteric, which affects women passing through the natural or artificial menopause.

Other vasoconstrictor substances.—Since the vasoconstriction which is responsible for arterial hypertension *is not nervous and there is no good reason* to incriminate the endocrine glands, we must look elsewhere In the last few years a very considerable body of evidence has accumulated pointing to the kidney as the origin of the pressor substance Before passing on to discuss the rôle of the kidney, we may mention briefly some of the older views on the ætiology of high blood-pressure, as taught to students a few years ago. These are epitomised in the familiar mnemonic G L A S S: G for gout, L for lead, A for alcohol, S for syphilis, and S for strain. Gout and lead poisoning are unimportant nowadays Alcoholism and indulgence of all kinds have been blamed for hypertension among other evils, but alcoholics have a low rather than a high blood pressure, and cardiac hypertrophy is uncommon among them Gluttony has long been held to be a potent cause of high blood-pressure, and no doubt they are often associated. Just how overeating causes high blood-pressure is by no means clear. Consumption of large quantities of meat and other proteins has been held responsible, without good evidence, and those hypertensives of carnivorous tendencies whose doctors forbid them meat might quote the interesting case of Stefannson, the arctic explorer, who spent eleven and a half years within the arctic circle, nine years of which he subsisted on meat alone, including a period of nine consecutive months. His blood-pressure was 115/55. Tobacco may be a subsidiary factor of some importance Dixon (1918) found that smoking of a Manila cigar by a novice caused a rise of 20 to 25 mm. in systolic pressure (which was followed half an hour later by a sharp fall), and others [33 34 38 40] have shown that a single cigarette causes distinct peripheral vaso constriction and often a rise in blood-pressure. Syphilis has been accorded a prominent place among the causes of high blood-pressure. Fishberg,[20] however, does not find the incidence of positive Wassermann reaction greater in hypertensives than in the general hospital population.

Hard work and hard living are widely believed to be important, if not predominant, causes of essential hypertension, but the athlete and the manual worker are no more prone than the clerk to high blood pressure The danger does not appear to be physical strain but what is popularly known as "the strain of modern life." There is some doubt, however, whether this portentous phrase means much more than the manifold worries and irritations which beset us all. Those who live high-pressure lives are perhaps more liable to hypertension; on the other hand, there

are many with hypertension who appear to be without a care and to have led a completely sheltered existence Neurasthenics usually have low blood-pressure Fishberg[20] sums up as follows:—

"In all probability, emotional and mental strain play purely an accessory rôle in the genesis of essential hypertension, serving to precipitate or aggravate the increase of blood pressure in those individuals who have inherited some constitutional predisposition to essential hypertension, which is of such fundamental importance"

RÔLE OF THE KIDNEY

Since the days of Bright (1836),[3] who first observed the association of chronic nephritis with enlargement of the heart and thickening of the blood vessels, until the end of the century hypertension was believed to be due to renal disease or to arteriosclerosis With the introduction of the baumanometer by von Basch (1893)[4] and the brilliant work of Clifford Allbutt (1895 and later)[1] it became evident that hypertension was extremely common and previous clinically recognisable renal disease the exception In recent years attention has again been focused on the kidneys, particularly by the experiments of Goldblatt and his associates,[21-25] who have crystallised the tentative work of numerous investigators by developing a standard technique for producing persistent hypertension of renal type in animals They partly occlude one or both renal arteries with adjustable clamps and find that loose constriction causes no rise in pressure, whereas moderate constriction causes the pressure to rise within a few days or weeks to a level often double the normal and to remain at a high level for at least five years If the arteries are severely constricted, pressure rises rapidly, often to a very high level, and the animal dies in uræmia within weeks or months If the arteries are totally occluded, the animal dies of renal failure within a few days, often with a fall in pressure. Similar constriction of other vessels, such as the splenic, mesenteric,[19] or both femoral arteries, does not affect the blood pressure Since some of Goldblatt's dogs have been observed to have a systolic pressure of 250 mm for five years without signs of renal failure, the resemblance to essential hypertension in man is striking, and in the hope of elucidating the mystery of essential hypertension Goldblatt and others have made the following observations in experimental hypertension due to renal ischæmia —

(1) This form of experimental hypertension is not due to renal failure, because (*a*) in most instances clinical and chemical signs of renal failure do not develop at all or only after years, and (*b*) constriction of the main artery of one kidney without interference with the other often causes a considerable rise of pressure persisting for months If the ischæmic kidney is excised, the blood pressure quickly falls to normal[26] There is a striking parallel to the observation in human pathology Several cases have recently been reported of unilateral "surgical" kidney (the other kidney being sound) associated with arterial hypertension[2,3,30], removal of the affected kidney was followed by fall of pressure to normal

(2) Hypertension due to moderate constriction of the renal artery is not due to fixed changes in the renal parenchyma If the clamps are removed after hypertension has developed, the pressure promptly falls to normal.[26]

(3) Hypertension is not due to nervous impulses The kidneys may be denervated,[27] the splanchnic nerves may be cut,[27] or the animal may be totally sympathectomised,[21] without more than momentarily reducing established hypertension and without preventing it when the renal arteries are subsequently constricted Again, hypertension develops in the usual way when a transplanted kidney is rendered ischæmic[6] Denervation or destruction of the adrenal medulla is equally ineffective in preventing or reducing hypertension[28]

(4) Goldblatt[22] has shown that excision of both suprarenal glands prevents or reduces the hypertension of experimental renal ischæmia, even when the animal is kept alive for months with sodium salt treatment If only a fragment of cortex remains, or if cortin is given, the pressure is not reduced Houssay[19] interprets this as meaning that cortin favours the production of vasoconstrictor substance by the kidney or renders the *vasoconstrictor mechanism* sensitive to its action

(5) A pressor substance may be prepared from ischæmic kidneys

Forty years ago Tigerstedt and Bergmann[37] prepared a pressor substance from normal kidneys This pressor substance has been called renin, and recently Pickering and Prinzmetal[38] and Landis et al[39] have extracted it from normal kidneys in considerable quantity and demonstrated its extraordinarily powerful and prolonged pressor action Landis makes the important point that renin, unlike adrenaline, pituitrin, and other substances that raise the blood-pressure, does not decrease the peripheral blood flow—a most significant observation, for neither is peripheral blood flow decreased in human hypertension. Harrison et al[33] and Prinzmetal and Friedman[34] claim to have demonstrated abnormal quantities of renin *in ischæmic kidneys of hypertensive dogs* Houssay and his co workers,[19] in a superb series of experiments, confirm the growing impression that hypertension of renal ischæmia is due to a pressor substance formed in the affected kidney They grafted the ischæmic kidneys of hypertensive dogs on to the main neck vessels of normal dogs and found a consistent and prolonged rise in blood-pressure One animal of their series possessed a kidney with two renal arteries One was constricted by an adjustable clamp rendering half the kidney ischæmic When this kidney was transplanted, the unconstricted renal artery was first anastomosed There was no rise in pressure The constricted artery was then anastomosed, and the pressure rose

Houssay suggests that this renal pressor substance (renin) is eliminated or destroyed by the normal kidney, and he summarises his evidence as follows. (*a*) *when the renal artery to one kidney is constricted*, a moderate slow rise of pressure takes place, which often falls to normal, (*b*) if the healthy kidney is then removed, there is a rapid rise in pressure, (*c*) the grafted ischæmic kidney has a greater pressor effect in nephrectomised dogs than in those with normal kidneys; and (*d*) in an animal with one renal artery constricted venous blood of the sound kidney had less vasoconstrictor effect than its arterial blood As the last statement implies, Houssay has demonstrated a pressor substance in the venous blood of ischæmic kidneys which has a powerful vasoconstrictor action, so removing a serious objection—namely, failure to demonstrate a pressor substance in the blood—to the renin theory of experimental renal ischæmic hypertension

To sum up, severe hypertension may be established in animals by partial constriction of the renal arteries. It is due to excessive production or abnormal action of a pressor substance (renin) in the affected kidney. This substance is present in the normal kidney and is eliminated or destroyed by the normal kidney

The action and/or production of renin is influenced by the suprarenal cortex

Surgical Treatment

Nearly all the operations to be described, designed to reduce arterial hypertension in man, are directed towards denervation of the kidneys, suprarenal glands, and the splanchnic area, since surgeons have believed (partly on faulty and incomplete evidence, partly wishful thinking) that essential hypertension is largely due to excessive vasomotor activity of nervous origin. From the evidence so far adduced the prospect of success of operation on the sympathetic nerves for hypertension seems remote; but the proof of the pudding is in the eating, and the results of surgical treatment of human hypertension will now be examined, the relation of human and experimental hypertension discussed, and possible accessory surgical methods mentioned.

In 1923 Pende recommended section of the left splanchnic nerve; in 1925 Brown and Pointer performed bilateral lumbar sympathectomy without success; in 1928 Crile treated 5 patients by removal of one suprarenal gland, without any fall in pressure, and in 1937 Friedman and Eisenberg [23] reported 5 patients treated by bilateral partial adrenalectomy, of whom 2 died of adrenal insufficiency and 3 were unimproved. Denervation of the kidneys by stripping the renal pedicle is equally disappointing (at all events in advanced cases, but see Pickering [43]). In none of these patients was there serious renal impairment.

The only "denervating" operations which have been at all encouraging involve division of the sympathetic nerves of the splanchnic area. This may be carried out in four ways:—

(1) By interrupting the sympathetic outflow by cutting the anterior nerve-roots from the sixth thoracic to the second lumbar segment.
(2) By dividing the splanchnic nerves and the sympathetic chain above the diaphragm.
(3) By dividing the splanchnic nerves and lumbar chain below the diaphragm.
(4) By removal of the cœliac ganglia.

(1) Page and Heuer [45] report 17 patients, all having diastolic pressures of over 120, treated by section of some half a dozen pairs of anterior nerve-roots from the mid-dorsal region downwards. Their patients were observed eight months to three years after operation, and 4 of the 17 did well. Headache, nervousness, dizziness, fatigue, palpitation, and even fits were relieved, and the blood-pressure fell to 160/100 or lower. A girl of twenty-three,[44] whose blood-pressure before operation was 190/122, was free from symptoms two and a half years later, and her blood-pressure was 150/96 (Fishberg puts the upper limit of normal blood-pressure at 150/90). An inevitable effect of this operation of anterior root section is paralysis of the abdominal wall This is said to be good, for it allows blood to drain into the splanchnic vessels more readily; but a paralysed abdominal wall is a mixed blessing even in a hypertensive. For this reason and because the necessarily extensive laminectomy is severe and has been followed by transverse myelitis other means of splanchnic sympathectomy are generally used.

(2) Max Peet divides the splanchnic nerves above the diaphragm and resects the lower three ganglia of the thoracic sympathetic chain. The nerves are approached by resecting a small piece of the eleventh rib, and both sides may be dealt with at one stage His operative mortality in 156 patients is 3 8 per cent.

Frehberg and Peet [22] recently reported results of his operation in 48 patients, whose average age was forty-six, observed three months or longer after operation: 6 were free from symptoms and their blood-pressure was reduced to 160/100 or lower; 8 showed a fall of more than 60 mm. systolic or 30 mm. diastolic; 10 a fall of 30 to 60 mm. systolic or 15 to 30 mm. diastolic; and in 24 the pressure did not fall. An example of a successful case is a man, aged twenty-nine, whose pressure was 236/160. Over two and a half years after operation it was 156/100. Another patient, aged twenty-two, had had hypertension for at least three years. The pressure was 280/190. One year after operation it was 132/95.

Peet [36] now reports the results of his operation in 315 patients in the last five years, claiming "complete recovery in 15% and distinct and permanent lowering of the blood pressure in about half." Peet's cases have been closely studied with regard to renal function, and the important suggestion emerges that, should a patient with some renal impairment react favourably to operation, renal function will improve proportionally to the fall in blood-pressure, and signs of impairment may disappear entirely. Davis and Barker [16] have performed Peet's operation in 6 carefully controlled cases, and they found that in each the blood-pressure had risen to the preoperative level with return of all the distressing symptoms. They found, however, that these patients had become susceptible to cyanate treatment, to which they had not responded before operation.

(3) Adson [2] and his associates at the Mayo Clinic carry out an extensive sympathectomy in two stages by a modified renal approach. The three splanchnic nerves, most of the cœliac ganglion, and the upper two lumbar ganglia and chain are removed on each side, so denervating the suprarenals, splanchnic vessels, and the kidneys. In his earlier cases Adson removed a portion of each adrenal, but he has not done so for the last two years, and the effect of the operation is not reduced. Of 44 cases observed for two to twenty-three months the results are given as good in 11, fair in 13, and poor in 20. By good is meant complete or nearly complete symptomatic relief and a blood-pressure of not more than 160/100. For example, a patient whose maximal pressure was 225/130 and minimal pressure 150/100 was well fifteen months later with a pressure of 128/90. Altogether 156 patients have now been operated on at the Mayo Clinic by Adson's method, and "functional cure" is claimed in 83 per cent.[36]

(4) Crile,[13 14] of Cleveland, has practised bilateral removal of the cœliac ganglion in some 140 patients. He claims symptomatic relief in 78 per cent. of patients, and the operative fatalities are limited to 3 in the last 123 patients. Of 19 patients seen seven months after operation, 3 are reported as having a normal pressure; but Crile does not say what he means by normal—in fact, his tables of results are so difficult to interpret that one cannot usefully quote further figures.

ASSESSMENT OF RESULTS

We now turn to the problem of assessing the value of surgery. To do so accurately is not yet possible. There is no question that improvement of symptoms and blood-pressure often takes place after splanchnic section, but similar improvement is the rule in most patients with hypertension when simply put to bed Nevertheless, we cannot escape the fact that in some instances surgery has relieved the victims of severe essential hypertension of all symptoms and has rendered them capable of full work, blood-pressure remaining at a normal level for years. An

instance of this kind was recently described by Ogilvie,[42] who writes

"Four years ago a surgeon of about 40 was forced by rising blood pressure, inability to concentrate, headaches becoming at times intolerable and failing vision to resign his university post and abandon his practice He underwent the operation of bilateral splanchnicectomy and immediately lost all his symptoms and returned to a normal blood pressure He obtained another post at a university in another State, and has been in full work ever since, his blood pressure showing no tendency to rise again I had not the good fortune to meet him, but I met many of his colleagues, and they are agreed that he is now able to work as hard as any of them To my question as to whether he was as good a man as before his symptoms appeared, they replied that he had lost some of his fire, he was not the 'go-getter' he used to be, but he was *still a fine surgeon*"

Though most physicians through whose hands pass many cases of essential hypertension can recall instances of extraordinary symptomatic recovery and some years of useful life in patients apparently at death's door, it appears to be extremely rare for the blood pressure to return to normal or near normal for any length of time There is strong evidence, therefore, that splanchnic section is sometimes dramatically successful The puzzle is to select suitable cases First, it should be recognised that most hypertensives improve with rest and the usual medical measures, that the average life of a hypertensive moderately afflicted is ten years after the hypertension is first discovered, and that many persons with a systolic blood pressure of 200 and more lead an active and fruitful life Whatever part it may eventually play, surgery has today no place in the treatment of the early stages of hypertension Operation should be confined to victims of severe hypertension—e.g, with a pressure frequently rising to 200/120 and more—whose symptoms are troublesome, and who do not readily improve with rest This group must be further pruned by eliminating those with distinct renal or myocardial failure or widespread arterial sclerosis, and operation is best avoided after the age of fifty Of the considerable number of potential candidates for surgery that remains it is found by experience that less than a quarter will obtain notable benefit from operation Unfortunately there is no infallible means of recognising those cases that will respond favourably except trial by ordeal—i.e, by the operation itself This is the method employed *in cancer surgery* Those patients with gross dissemination are eliminated, but we are obliged to operate on the rest knowing that two thirds of them are already doomed by dissemination, then undetectable, but not knowing who will be saved and who taken But, whereas the surgery of cancer is established, that of hypertension is experimental, and it is wrong to sacrifice the majority in favour of the odd case that might benefit Adson,[10] Child,[11] and Craig [12] have shown that those patients are most likely to respond whose blood-pressures approach the normal when at rest or asleep, when given nitrites, and particularly when lightly anæsthetised with drugs such as sodium pentothal If to these tests there is no appreciable fall in pressure, the hypertension is said to be fixed, and splanchnic section will almost certainly fail Unfortunately a good response to *these tests, though* hopeful, is no guarantee of a good response to operation Another test, which is attractively direct, is to induce temporarily the effect of splanchnic section by paralysing the splanchnic nerves by injection of Novocain I have tried this method and believe that it is unsatisfactory, for, if there is no fall in blood pressure, it may be because injection is misplaced, and, if the pressure does descend, it is as likely to be due to syncope as to splanchnic paralysis, for the procedure causes distress

CORRELATION OF EXPERIMENTAL WORK AND SURGICAL RESULTS

It remains for us to try to explain the results of splanchnic section why it often has no effect on the blood pressure, and why it is sometimes followed by a fall to normal It may be postulated that in the early stages of essential hypertension blood flow to the renal tissue is reduced by constriction of the renal blood vessels, especially afferent glomerular arterioles, by nervous impulses. This causes excessive production of renin, which enters the blood stream, causes generalised vasoconstriction, and raises the blood pressure If splanchnic section is undertaken at this stage, the renal arteries dilate and blood pressure falls If not, structural changes take place in the arteries, not only rendering dilatation impossible but also causing further narrowing More renin is produced, a vicious circle is established, and hypertension becomes permanent and progressive The importance of high intra-arterial pressure as a *mechanical factor in producing lesions of the renal* arterioles is proved by Wilson and Byrom's [55] recent demonstration in rats of renal vascular lesions typical of malignant hypertension When the rat is rendered hypertensive by constriction of one renal artery, gross arterial changes are found in the opposite kidney but not in the ischæmic one, whose clamp protects it from the general hypertension

OTHER MEANS OF SURGICAL TREATMENT

There is a close resemblance between essential hypertension and experimental hypertension due to renal ischæmia, and it seems probable that a pressor substance like renin is at work in man as in animals The outstanding objection to the chemical (renin) theory of essential hypertension is failure to demonstrate a pressor substance in the blood Transfusion of even 2 litres of blood of a hypertensive into a normal person does not cause a significant rise in pressure,[47 48] but in these experiments the recipient's kidneys were normal, and there is some evidence to show that normal kidneys remove the pressor substance [49] The high level of pressure in essential (and nephritic) hypertension is maintained chemically, and the pressor substance is probably of renal origin and may be identical with renin *Assuming for a* moment the truth of the renin theory, what is to be done? The obvious course is to improve the renal blood supply Goldblatt [26a] states

"If before constricting the renal artery, the kidney is decapsulated and adipose tissue or muscle is attached to the denuded cortical surface, the accessory circulation becomes very prominent and interferes with the development of permanent elevation of blood pressure"

The astonishing power of vascularisation possessed by the omentum is familiar to surgeons and has been applied in the operation of cardiomyopexy, developed by O'Shaughnessy [43a] According to Samaan grafting of the omentum on to the decapsulated ischæmic kidney in a hypertensive animal so improves the renal blood supply that the blood pressure falls to normal. This, if true, is an observation of the first importance, but it awaits confirmation Even if successful in animals it would not necessarily work in man The essential difference between hypertension due to experimental renal ischæmia and human hypertension is the site of arterial narrowing

Experimentally, the main renal artery is constricted; in man the afferent glomerular arterioles are probably involved. To benefit human hypertension it would therefore be necessary to establish arterial communications of sufficient size with the afferent glomerular arterioles to raise the pressure therein. Nephro-omentopexy could readily be combined with subphrenic splanchnic denervation, the capsule being stripped from the left kidney and the omentum brought through an incision in the peritoneum and wrapped round it. The *right* kidney might also be decapsulated in the hope of acquiring a subsidiary blood-supply from the perirenal tissue. It is probably unwise for technical reasons to attempt right or bilateral nephro-omentopexy.

Summary and Conclusions

(1) After the age of fifty 1 death in 4 is due to arterial hypertension.

(2) Renal failure is the cause of death in less than 10 per cent of cases of arterial hypertension.

(3) Whatever the initial cause of raised blood-pressure in "essential" arterial hypertension, the hypertension itself is the dangerous factor and the commonest cause of death.

(4) The general circulatory efficiency is not increased in essential hypertension.

(5) Consequently, there is no fundamental objection to reducing the blood-pressure in essential hypertension.

(6) Essential and nephritic hypertension is maintained by generalised arterial and arteriolar constriction which is not nervous but chemical.

(7) The hypertensive factor in experimental hypertension due to renal ischæmia is a pressor substance of renal origin known as renin. Human essential and nephritic hypertension closely resemble this form of experimental hypertension.

(8) Surgical treatment of arterial hypertension is still in the experimental stage. Of the operations so far performed wide splanchnic denervation is the operation of choice. Operation should be limited to a small and carefully selected group of patients with severe but still labile hypertension. The result of operation is predictable up to a point but never certain. Brilliant successes have been reported.

(9) Nephro-omentopexy in addition to splanchnic sympathectomy may be of value.

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(Continued at foot of next column)

THE MECHANISM OF DIABETES MELLITUS*

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II—THE CONTROL OF THE BLOOD-SUGAR LEVEL

(Continued from p 68)

RÔLE OF THE LIVER

The discovery by Claude Bernard that the liver secretes glucose into the blood led him to state that the liver was of prime importance in the *maintenance of the normal blood-sugar level*. His suggestion has been fully confirmed by the experiments on hepatectomised animals.[91] An excellent picture of the functioning of the liver in ordinary circumstances is provided by experiments demonstrating the effect of ingestion of glucose on the inflow and outflow of sugar from the liver. Recently Tsai and Yi[133] have demonstrated that, whereas the liver in the fasting state secretes glucose into the blood, when an excess of glucose enters the blood glucose is removed by the liver. This work has been confirmed in greater detail by Soskin and his colleagues,[125] who have shown that after the hyperglycæmia caused by injection of glucose the liver

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ceases to secrete and stores sugar until the blood sugar level falls to normal Then there is a period during which sugar flows neither in nor out of the liver, and finally the liver begins to secrete glucose again These results are readily interpreted on the basis of the adjustment of the head of pressure of blood sugar to the needs of the tissues In the *fasting* state the liver supplies sugar to the blood in proportion to the peripheral utilisation, and the head of pressure of sugar in the blood thus remains constant Exogenous hyperglycæmia supplies the tissues with abundant sugar, and the utilisation of this sugar by them is aided by the secretion of pancreatic insulin As a result the tissues are satiated with sugar and the liver, being no longer stimulated to secrete, is able to store sugar With the subsidence of hyperglycæmia the peripheral tissues now contain carbohydrate in excess of their needs and the liver is not stimulated to secrete glucose until this excess of carbohydrate is disposed of and the normal needs of the tissues again establish themselves The reaction of the liver to a fall in the head of pressure of blood sugar below that requisite for the needs of the tissues is well exemplified in the sequence of events following the administration of phloridzin In the attempt to prevent the head of pressure of sugar in the blood from falling under the steady drain of glycosuria the stored liver glycogen is broken down and liberated as glucose into the blood When this source is exhausted, the liver breaks down body proteins to sugar, and combustion of fat proceeds at an increased rate The accelerating combustion of proteins and of fat is reflected in the urine by increasing excretion of nitrogenous substances and of ketone bodies After removal of the pancreas a similar increased combustion of protein and fat takes place, and the dependence of these processes, as well as the maintenance of the blood sugar at high levels, on hepatic activity is shown by their disappearance after hepatectomy [91 95 102] The manner in which the various endocrine glands influence these reactions of the liver has already been discussed

Little is known about the mechanism which controls the liver in its accurate and rapid adjustment of the blood sugar level Although the action of adrenaline in *stimulating* hepatic glycogenolysis is adequate to explain the recovery of the blood sugar level when this falls below 70–80 mg per 100 c.cm,[19] it is not adequate to explain either adjustment at higher blood sugar levels or the prompt and delicate adjustment at normal levels The existence of some other mechanism is suggested by the extreme susceptibility of *animals* injected with anterior pituitary extracts to emotional hyperglycæmia and by their normal response to intravenous adrenaline That the mechanism of adjustment is extremely sensitive is shown by experiments with pancreatic grafts in otherwise depancreatised dogs, within a few minutes of excluding the graft from the circulation the blood sugar begins to rise, only to return and remain at normal levels again when the circulation to the graft is restored [47] According to Macleod [88] *stimulation* of the hepatic nerves can initiate glycogenolysis in the liver, and it may be that not only the immediate adjustment of hepatic outflow of sugar but also the secretion of the anterior pituitary gland are controlled by some centre in the brain which is extremely sensitive to decreasing utilisation of carbohydrate whether this be due to lack of carbohydrate or impaired ability to deal with the carbohydrate available

The question of the interaction of the liver and the blood sugar level cannot be left without considering the interesting hypothesis of the homeostatic function of the liver advanced by Soskin [121 125] and widely accepted in America According to this theory the decision as to whether the liver secretes sugar depends on whether the *blood sugar* is below or above a certain *threshold value* This threshold value is influenced by insulin and by the secretion of the *anterior pituitary* when the supply is deficient or the pituitary secretion is excessive, the threshold is *raised*, with the result that the liver pours sugar into the blood and a state of "*diabetes*" is produced, when the supply of insulin is excessive or the pituitary secretion is diminished, the threshold is lowered, the liver removes sugar *from* the blood, and hypoglycæmia results The conception we have been developing in these lectures regards hepatic function as a process adjusted to the needs of the tissues for sugar and subserving the definite object of maintaining the requisite *head of pressure* of blood sugar The *homeostatic* theory, on the other hand, regards the blood sugar level as an *expression of activity* of the liver and this *activity* as being determined not by the needs of the tissues *for carbohydrate* but by the *particular state* of the liver at *any one time* Since the liver plays such an *important* part in *carbohydrate metabolism*, the homeostatic theory *naturally offers* many convenient *explanations* of this aspect of metabolism, but it fails completely to account for the observed *correlations of hepatic functions* with *utilisation of sugar* by the peripheral tissues As an example of this failure the effect of *starvation* may be quoted Starvation causes the blood-sugar tolerance curve to rise to high levels, utilisation of sugar by the *peripheral* tissues normally increases with the height of the blood sugar, yet *after starvation* the normal effect of *glucose in increasing* the oxidation of carbohydrate is greatly diminished, and according to Mann [91 92] and Drury,[36] though not to Soskin and Murphy,[123] in starvation carbohydrate utilisation by the peripheral tissues is *impaired* Again, according to this theory, hypophysial extracts lower the *threshold* at which the liver secretes sugar into the blood, but an explanation is also required of why the same extracts *simultaneously* inhibit insulin action *in the peripheral* tissues *It appears* that, although the homeostatic theory offers many reasonable explanations of hepatic *functions* considered as a *self contained* phenomenon, it does not throw any light on the *relation* of this function to carbohydrate *metabolism* as a whole

Before leaving the question of the rôle of the liver, attention must be drawn to some remarkable *experiments* which may ultimately prove of great importance Markowitz, Mann, and Bollman [86] have shown that after total removal of the liver there is a steady decline in muscle glycogen, and that, although *partially hepatectomised animals readily form muscle-glycogen*, totally hepatectomised dogs do not do so unless relatively enormous quantities of insulin and glucose are injected. They have also shown that insulin action is normal shortly after hepatectomy but may be completely abolished several hours later In rabbits in which the liver was excluded without anæsthesia I have confirmed this fall in muscle-glycogen, and I have also found *impairment* of insulin action in animals from which the liver had been excised This work *suggests* the possibility that the liver is requisite for effective insulin action in the peripheral tissues, and in this connexion it may be recalled that *numerous cases of diabetes*

mellitus which have shown a high grade of insulin resistance have been cases complicated by disease of the liver.[4 37 109 114 130] Impressed by these observations and by experiments indicating that insulin action in the peripheral tissues varied in different circumstances I suggested that the liver might secrete a substance which activated insulin.[59 60] This suggestion still stands and has recently been supported by Krebs's observations [82] that insulin is susceptible of activation

PANCREATIC DIABETES AND INSULIN ACTION

After removal of the pancreas from an animal a syndrome develops which is closely similar to human diabetes mellitus. The blood-sugar level rises and glycosuria is produced. The excessive breakdown of body protein is shown by an increased excretion of urinary nitrogen, and the excessive utilisation of fat by ketonuria.[126] All these findings can be diminished by hypophysectomy, and all, except possibly the increased excretion of nitrogenous bodies in the urine, can be induced in the normal animal by extracts of the anterior-pituitary gland.[72 73 117] Removal of the liver from the depancreatised dog leads to a fall of blood-sugar,[95] of urinary nitrogen, and of ketonuria, and in the normal animal it prevents the effects of pituitary extracts.[73] Thus the liver is the seat of the positive reactions to pancreatectomy—namely, hyperglycæmia,[95] increased breakdown of body protein,[91] and production of ketone bodies [21 102]—and this response of the liver is facilitated by the secretion of the anterior hypophysis. These reactions are called forth by deprivation of insulin, and administration of insulin restores the metabolism of the depancreatised dog to normal. Under its action the blood-sugar falls to normal levels, glycosuria and ketonuria disappear, and the excessive excretion of nitrogen in the urine diminishes. At the same time dietary carbohydrate is retained in the body, ingested protein is no longer hastily broken down to glucose, and the disproportionate utilisation of fat ceases But to prevent the return of the diabetic syndrome insulin must be given in adequate and regular doses. The necessity for an adequate supply of insulin must be clear to every physician who has balanced a diabetic patient. The presence of a regular supply of pancreatic insulin in the healthy subject is indicated by the relatively rapid appearance of hyperglycæmia after pancreatectomy [95] and by contrasting the irregular control of the blood-sugar, achieved by two daily injections of insulin, in the depancreatised animal with the steady control which follows the establishing of a pancreatic graft.[47] To preserve normal metabolism a regular and adequate supply of insulin must be maintained, and this implies that in the course of metabolism insulin is destroyed

The mechanism of insulin action within the individual cell is still unknown, and even on questions of its general effect within the body controversy still exists. Some workers still hold to the opinion that after pancreatectomy the ability of the animal to utilise carbohydrate is unimpaired and regard diabetes mellitus as due primarily to overproduction of sugar. Since this point is of such fundamental importance, it is necessary to indicate the oversight which has led to this opinion. Lusk [87] established that in diabetic animals the respiratory exchange was theoretically compatible with the idea that such animals had lost the power to use glucose; but, since this interpretation of his results depends on the assumption, now being challenged, that animals cannot change fat into carbohydrate, his conclusions are not universally accepted. Evidence that the peripheral tissues of the depancreatised animal can use some glucose is provided by the rapid decline of the blood-sugar that follows hepatectomy in the depancreatised animal,[95] and this evidence has been supported by the demonstration that hypophysectomy in the depancreatised animal partially restores the animal's power to oxidise carbohydrate.[13 72 73 74 126] The dependence of this peripheral utilisation of sugar on the blood-sugar level has been demonstrated by Soskin and Levine,[126] who have shown that in eviscerated animals the rate at which the peripheral tissues use injected glucose is proportional to the height of the blood-sugar, and further that in such preparations made from depancreatised dogs the rate of sugar utilisation, at blood-sugar levels characteristic of the depancreatised animal, is of the same degree as occurs at normal blood-sugar levels in the preparations made from normal animals In view of this evidence the original idea that the depancreatised animal has completely lost the power to utilise carbohydrate cannot be maintained, but this new evidence does not permit the assumption that the power to utilise glucose is unimpaired. The fact that the most characteristic action of insulin is to accelerate removal of sugar from the blood by the peripheral tissues [18 91 94] in itself suggests that in the depancreatised animal the ability of the peripheral tissues to do this would be reduced. So long ago as 1912 it was shown by Knowlton and Starling [81] that the hearts of diabetic dogs used less sugar than the hearts of normal dogs, and it has since been shown that the same is true of other tissues [88 111] Many of Lusk's experiments are acceptable on the basis that in diabetes utilisation of sugar, although not lost, is impaired. The observation that in eviscerated normal animals hyperglycæmia accelerates the utilisation of carbohydrate, whereas in eviscerated diabetic animals with the same degree of hyperglycæmia the utilisation of carbohydrate is not increased, demonstrates that in the latter animals under these conditions peripheral utilisation is impaired.[126] The most probable explanation of these findings seems to be that the tissues of the body have an inherent capacity to utilise sugar at a slow rate, but that, when the blood-sugar level is within normal limits, their capacity to utilise carbohydrate at a normal or rapid rate depends on an adequate supply of insulin. The whole controversy that has centred round the two rival theories of diabetes—the "overproduction theory" and the "under-utilisation theory"—appears to have arisen because it has not been realised that there are mechanisms in the body which can do much to mitigate the effects of *impaired* ability to utilise carbohydrate The opposing ideas, either that in pancreatic diabetes the power to utilise carbohydrate is lost or that it is unimpaired, are both unable to explain large numbers of established facts; but, so far as I am aware, there are no facts incompatible with the hypothesis that in pancreatic diabetes the utilisation of carbohydrate is impaired, but that this impairment is largely compensated by adequate elevation of the head of pressure of sugar in the blood with consequent acceleration of carbohydrate utilisation

Naturally the different conceptions of the nature of pancreatic diabetes have led to different views on the function of insulin Those who hold the view that diabetes results from unchecked overproduction of sugar by the liver see in insulin the agent which checks this excessive activity on the part of the liver; those who hold that diabetes results from impaired

ability of the tissues to utilise carbohydrate see in insulin the factor which restores this impaired ability to normal The action of insulin in directly accelerating the utilisation of sugar by the peripheral tissues has been established beyond any doubt The evidence that insulin acts directly on the liver is at best slender [7 108] The view that it does so appears to be simply a special explanation of the observation that after administration of insulin to depancreatised animals the rate of formation of sugar by the liver is retarded This observation appears to be more logically explained as the result of insulin removing the necessity for a compensatory rise of blood sugar and thus allowing the rate of sugar formation by the liver to decrease to normal levels

DYNAMIC EQUILIBRIUM OF THE BLOOD SUGAR

A brief survey has now been made of some of the main phenomena of carbohydrate metabolism Considered by itself each phenomenon is complicated, and its significance in relation to metabolism as a whole is often not apparent But throughout the whole of normal and abnormal carbohydrate metabolism runs the recurring theme of variations in the head of pressure of blood sugar, and by this theme changes in function of the different organs can be correlated and can be seen to be part of an ordered and useful plan It is appropriate at this stage to attempt this correlation by expressing the observations we have been considering as an inclusive theory

It is suggested that the height of the blood sugar level is the essential mechanism determining the rate of carbohydrate utilisation by the tissues, and that the head of pressure of sugar in the blood is adjusted to that level which, in the particular circumstances, ensures, or comes nearest to ensuring, an adequate rate of carbohydrate utilisation When the ability of the tissues to use carbohydrate is impaired, as by deficiency of insulin, impairment of insulin action, or lack of oxygen, the head of pressure of blood sugar is raised, thereby facilitating the ability of the tissues to use sugar When the ability of the tissues to use carbohydrate is restored or increased, the head of pressure of blood sugar is adjusted to lower levels and excessive utilisation of carbohydrate avoided Thus the head of pressure of sugar in the blood is adjusted at any particular time to the needs of the tissues The liver is the agent of this adjustment When the needs of the tissues are fully satisfied, the liver stores blood sugar as glycogen, when the needs of the tissues are not satisfied, the liver secretes sugar and thus raises the head of pressure of blood sugar If the demands of the tissues are great sugar is secreted at such a rate that the hepatic stores of glycogen are rapidly depleted and the liver is driven to form new sugar from protein and, possibly fat The liver is influenced in these reactions by factors secreted by the anterior lobe of the pituitary gland When these are present in excess, the rate of breakdown of liver glycogen and formation of sugar from non carbohydrate sources is accelerated, when they are absent, these processes are retarded The secretion of these pituitary factors increases in proportion as the needs of the tissues for carbohydrate are unsatisfied

The facts at present available suggest that the ability to utilise carbohydrate is inherent in the tissues, and that this utilisation is facilitated by insulin and retarded by factors secreted by the anterior pituitary gland The efficiency and sensitivity of these mechanisms indicate that the unvarying maintenance of a concentration of sugar in the blood adequate for the needs of the tissues is a point of vital importance in the economy of the body It is difficult to believe that a mechanism for such rapid and sensitive adjustment of the blood sugar level could be necessitated by the needs of such relatively robust structures as muscle, which contain large reserves of carbohydrate and can continue to function for a considerable time, even when totally deprived of their blood supply. It is suggested that the object of this efficient and sensitive mechanism is to ensure to the central nervous system a supply of sugar adequate for its needs. So far as is known, the brain utilises only carbohydrate [7] it contains little or no reserves of carbohydrate,[115] and consciousness depends on an adequate supply of blood sugar, it is as sensitive to deprivation of carbohydrate as it is to deprivation of oxygen The theory may now be illustrated by various examples

In starvation [108] the liver supplies sufficient sugar to the blood to maintain the blood-sugar constant To do this the liver forms sugar from non carbohydrate sources, and this process is revealed by increased excretion of endogenous nitrogen in the urine and by the appearance of ketonuria The new formation of carbohydrate is facilitated by increased secretion of the anterior-pituitary gland, which also economises the utilisation of blood sugar by retarding the action of insulin in the peripheral tissues After some days of starvation the metabolic rate has fallen considerably, and as a consequence the demands of the tissues for carbohydrate from the liver are reduced The formation of sugar by the liver from non-carbohydrate sources therefore diminishes, as is shown by the fall in urinary excretion of nitrogen and by the disappearance of Ketonuria The mechanism of the fall in metabolic rate is not understood

In phloridzin poisoning the head of pressure of blood sugar tends to sink below that adequate for the needs of the body The liver responds by pouring sugar into the blood, which is first derived from the store of liver-glycogen and later from non-carbohydrate sources Secretion of the anterior pituitary gland occurs which retards peripheral utilisation and expedites new formation of sugar

On injection of insulin into a normal animal the removal of sugar to the peripheral tissues, especially the muscles, is increased and the needs of the tissues are satisfied The liver is no longer called on to secrete glucose, and as a result of this and the increased rate of peripheral removal the blood-sugar sinks The fall of the head of pressure of blood-sugar in turn retards peripheral removal of sugar Persistence of the blood sugar at hypoglycæmic levels is prevented by secretion of adrenaline, stimulating hepatic glycogenolysis, and it is possible that the object of this emergency secretion is to restore an adequate supply of sugar to the brain, which, unable to store glucose even under the action of insulin, cannot survive long periods of hypoglycæmia

In pancreatic diabetes the tissues, owing to lack of insulin, cannot utilise carbohydrate sufficiently rapidly for their needs In an attempt to accelerate the utilisation the liver pours sugar into the blood until the head of pressure of blood-sugar reaches levels which either satisfy the needs of the tissues or cannot be increased Since the demand for sugar is great, the store of liver-glycogen is rapidly exhausted and, to maintain the flow of sugar into the blood, the liver is driven to manufacture sugar from non carbohydrate materials The concomitant increased secretion by the pituitary gland facilitates the new formation of sugar by the liver but at the same time retards still further the utilisation of glucose by the tissues If now the pituitary gland is removed the formation of sugar from non carbohydrate materials

is greatly reduced, and ketone formation diminishes with the result that the danger of fatal ketosis becomes remote. At the same time the retardation of peripheral sugar utilisation is removed, and in consequence the blood-sugar is more adequately utilised. For these reasons the hypophysectomised depancreatised dog, although it still suffers from diabetes in an attenuated form, will eke out its existence for several months.

The mechanism of pancreatic diabetes cannot be left without reference to Allen's classical work upon which the "under-nutrition treatment" of human diabetes was based.[5] He showed that in dogs from which sufficient pancreas had been removed to render them on the verge of diabetes overfeeding precipitated

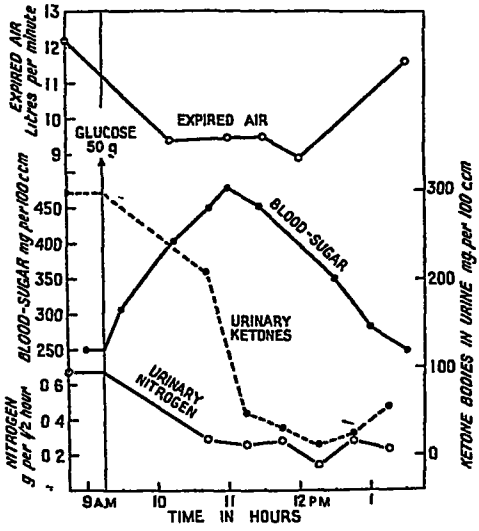

FIG 6—The effect of ingestion of 50 g. of glucose in an untreated diabetic patient. It will be seen that, as the blood-sugar rises, the excretion of nitrogen and ketones in the urine falls [59]

diabetes, whereas with underfeeding diabetes did not develop. The islets of Langerhans in the pancreas remaining in the dogs made diabetic by overfeeding showed typical degeneration.[6] Young has produced permanent diabetes [140] and similar lesions of the pancreas in normal dogs [112] by injecting anterior-pituitary extracts. It is suggested that in Allen's partially depancreatised dogs the high needs of the tissues for sugar, consequent upon overfeeding, called for more insulin than was available from the pancreatic remnant. Consequently the needs of the tissues for sugar were relatively unsatisfied, and in an attempt to remedy this the blood-sugar was raised to high levels and new formation of carbohydrate by the liver was accelerated. To facilitate this process, pituitary factors were secreted in excess and secondarily produced the degeneration of the islet cells, with the result that ultimately permanent diabetes developed. By keeping these dogs in a state of chronic undernutrition this unfavourable sequence of events can be avoided.

The clinical study of human diabetes provides numerous examples of the dynamic equilibrium of the blood-sugar. The two following examples will suffice as illustrations It is a well-known clinical observation that in diabetes mellitus the blood-sugar level rises spontaneously during the night,[54] and, if the patient is receiving insulin during the day, this rise is by contrast all the more striking. During the day relatively adequate utilisation of carbohydrate by the tissues is ensured by the dietary carbohydrate and the insulin which the patient is receiving. In the fast between supper and breakfast the action of the injected insulin wanes, with the result that the ability of the tissues to utilise carbohydrate diminishes, and as a consequence the liver is stimulated to pour sugar into the blood and to increase the head of pressure of sugar in the blood. This spontaneous rise of blood-sugar can be prevented either completely or partially by measures which promote utilisation of sugar by the tissues during the night, such as nocturnal injections of insulin, exercise, or, in favourable circumstances, a carbohydrate meal at midnight before the rise has set in.

The beneficial effect of raising the blood sugar in a human diabetic patient is well shown by the following example.[58]

A young untreated female diabetic was admitted with severe ketosis She was given quantities of water to drink and frequent urine specimens were obtained. When the excretion of ketone bodies and nitrogen in the urine samples had reached a constant level, the patient was given 50 g. of glucose by mouth, but not any insulin. With the consequent rise of blood-sugar the ketonuria and excretion of urinary nitrogen diminished; but, as the blood-sugar fell, the ketonuria and urinary nitrogen excretion rose again (fig. 6).

It is a well-established clinical observation that ketonuria increases with the approach of diabetic coma and diminishes as this danger recedes, and recently Gray has shown that there is a similar change in ketonæmia [50] It appears, therefore, that with the rise of blood-sugar the severity of the diabetes became less, but with the fall of blood-sugar the severity again increased The explanation of this sequence of events seems to be as follows As a consequence of the diminished ability of the tissues to use carbohydrate the liver, in an attempt to compensate this disability, poured sugar into the blood and hyperglycæmia resulted. But the head of pressure of sugar in the blood achieved by the liver was insufficient to accelerate utilisation of sugar by the tissues to a degree which satisfied their needs. As a consequence the demands on the liver continued, with the result that the formation of sugar from non-carbohydrate sources proceeded rapidly and was manifested by ketonuria and increased excretion of nitrogen in the urine At this stage the patient received the glucose With the consequent rise of blood-sugar the tissues received, and therefore used, more carbohydrate, the demands on the liver decreased, and consequently the new formation of sugar by the liver diminished. This was shown by a fall in ketonuria and urinary nitrogen. With the subsequent fall of the blood-sugar the original state re-established itself. The suggestion follows that the reason why a diabetic passes into diabetic coma is primarily because he cannot raise his blood sugar high enough to ensure adequate utilisation of carbohydrate; for, if this object were attained, the excessive metabolism of protein and fat would diminish and ketosis would not develop This suggestion is not incompatible with clinical experience, for it is known that, as a result of giving glucose and insulin, the blood-sugar level after recovery from coma may be higher than when coma was present; nor is it uncommon to see patients up and about and well with blood-sugar values at levels higher than those found in many comatose patients.

CYANOSIS CAUSED BY SULPHONAMIDE COMPOUNDS

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CYANOSIS developing during the course of treatment with drugs of the sulphonamide group has been found by Colebrook and Kenny (1936), Paton and Eaton (1937), Discombe (1937), Wendel (1938), Gley (1937), and others to be due to the conversion of part of the circulating hæmoglobin to sulphæmoglobin or to methæmoglobin. Several observers have, however, reported its development in cases where no alteration of the blood pigment could be detected spectroscopically, and where there was no change in the oxygen carrying power of the blood (Colebrook and Purdie 1937, Marshall and Walzl 1937, Cheesley 1938). By way of explanation, some of them have postulated the formation of a coloured aniline derivative in the blood stream (*Young and Wilson* 1926–27, Ottenberg and Fox 1938, Marshall and Walzl 1937).

During an extensive clinical use of *p* aminobenzenesulphonamide and 2 *p* aminobenzenesulphonamido pyridine we have found that cyanosis of varying intensity has been a frequent symptom, but we have always been able to account for it either from the clinical state of the patient or by careful spectroscopic examination of the blood. In cases treated with *p* aminobenzenesulphonamide the pigment may be either methæmoglobin or sulphæmoglobin but in our experience is more frequently the latter. On the other hand, the pigment formed during treatment with 2 *p* aminobenzenesulphonamidopyridine is practically always methæmoglobin. Of 32 cases of pneumonia treated with this drug methæmoglobin was detected in the blood of 25, and no case of sulphæmoglobinæmia developed spontaneously, despite the fact that no special precautions were taken to avoid purgation or sulphur containing foods.

With the usual type of clinical spectroscope the differentiation between sulphæmoglobin and methæmoglobin is not always easy, because the characteristic absorption bands of both lie in the same vicinity at the red end of the spectrum. The sulphæmoglobin band occupies the wave lengths from 615 μμ to 630 μμ, whereas that of methæmoglobin occupies the wave lengths from 625 μμ to 655 μμ. It is, however, of some importance from the prognostic point of view that the differentiation between the two pigments should be made, because cyanosis due to sulphæmoglobin lasts for several weeks whereas that due to methæmoglobin remains only a few days. In this investigation several types of spectroscopes were employed. It was found that one of small dispersion was the most suitable for detecting absorption bands at the red end of the spectrum. For the accurate measurement of the position of an absorption band a large model Hilger constant deviation spectroscope was used. Quantitative estimations of the meter was used. Quantitative estimations of the absorption of light were made with this instrument together with a Nutting photometer. In some experiments band positions were compared with the Hartridge reversion spectroscope.

In the course of the investigation it became evident that for accurate spectroscopic examination of the blood, particularly for the presence of methæmoglobin, two precautions are necessary:—

(1) The blood must be laked with a small volume of water (not more than 1 in 5) so that the pigment may be in a concentrated solution.

(2) The specimen should be examined as soon after withdrawal as possible.

Table I shows the percentage of methæmoglobin which must be present in a mixture with oxyhæmoglobin before its absorption band becomes visible to the eye. These figures were obtained by examining the spectrum through two absorption cells of equal depth (0·5 cm.), one cell containing oxyhæmoglobin and the other methæmoglobin. By varying the proportion of methæmoglobin and oxyhæmoglobin so that the percentage of methæmoglobin was reduced while the total content of blood pigment in the two cells remained constant, the lowest percentage of methæmoglobin which could be detected was determined for different dilutions of blood. It will be seen that in a 1 in 50 dilution of blood the band of methæmoglobin appeared only when 50 per cent. or more of the total pigment was present as methæmoglobin, but that this critical limit was reduced as the strength of the hæmoglobin solution was increased. It will be obvious therefore that, unless the blood is laked with only a small amount of water (not more than 1 in 5) or is examined in a layer several centimetres thick, the presence of methæmoglobin may easily be missed.

TABLE I—METHÆMOGLOBIN

Dilution of blood	Minimal concentration of methæmoglobin producing visible absorption (per cent.)	
1–50	50	Faint line
1–20	30	
1–5	10	

TABLE II—SULPHÆMOGLOBIN

Dilution of blood	Minimal concentration of sulphæmoglobin producing visible absorption (per cent.)	
1–50	10	Faint line
1–20	4	
1–10	2	Well marked line
1–5	0·5	

The same thing is true if a considerable time elapses between the withdrawal of blood and its spectroscopic examination. Fig. 1 shows graphically the absorption coefficients measured at 634 μμ at intervals after withdrawal of a sample of blood from a case of methæmoglobinæmia. The density of the characteristic band diminishes rapidly, in cases where the amount is not large it may be entirely absent in twelve hours. This is probably due to a gradual increase in the pH of the blood, for the characteristic band of methæmoglobin is well seen only in a neutral or acid solution.

These precautions are not so essential in the case of sulphæmoglobin. Table II shows that a 10 per cent. concentration of this pigment can be detected in dilutions of blood as low as 1 in 50, and that in a 1 in 5 dilution a concentration of 0·5 per cent. gives an easily visible line, whereas fig. 1 shows that even thirty hours after the withdrawal of blood from a patient with sulphæmoglobinæmia there is no alteration in the density of the band at 625 μμ.

These observations suggest that the number of cases of cyanosis reported as developing during

sulphonamide treatment, without demonstrable sulphæmoglobinæmia or methæmoglobinæmia and without obvious cause, might be considerably reduced if samples of blood were examined promptly and in

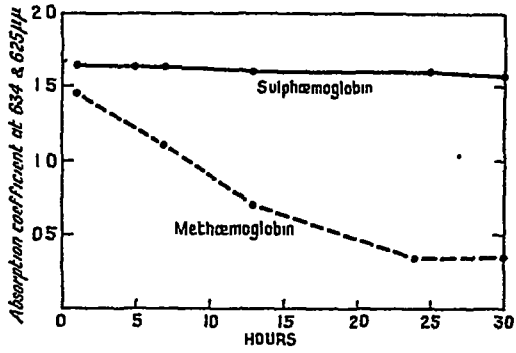


FIG 1—The variation in the absorption coefficients in the same sample of blood from a case of sulphæmoglobinæmia and from a case of methæmoglobinæmia The density of the band diminished rapidly in the case of methæmoglobin but remained unchanged in the case of sulphæmoglobin

concentrated solution, and that it may be unnecessary to speculate on the possibility of any coloured derivative of aniline being the causal agent of the symptom. Wendel (1938), employing a technique somewhat similar to ours, has reported that he can demonstrate the presence of methæmoglobin in every case receiving sulphonamide where the blood concentration of the drug is over 4 mg. per 100 c cm., and our experience agrees with this observation.

TREATMENT OF CYANOSIS

Although the onset of cyanosis is usually without serious significance, it is alarming and may have a disturbing psychological effect on the patient and his relations Further, as Discombe (1937) has pointed out, in conditions of severe anæmia or in serious pulmonary disease, such as lobar pneumonia, a reduction in the oxygen capacity of the blood, consequent on the development of methæmoglobinæmia or of sulphæmoglobinæmia, may be sufficient to cause dangerous anoxæmia and thus aggravate considerably the disability of the patient Any method of prevention or treatment of this symptom, therefore, would be a welcome adjunct where the prolonged administration of drugs of the sulphonamide group is necessary. The use of methylene-blue in the treatment of methæmoglobinæmia, originally suggested by Hauschild (1936), has been advocated by Wendel (1937) and favourably reported on by Hartmann et al (1937), although it constitutes a therapeutic measure of some importance, its scope in the prevention and treatment of the various abnormalities of blood pigment produced by sulphonamides has not been fully investigated. We decided, therefore, to try to assess its therapeutic value in the treatment of methæmoglobinæmia and sulphæmoglobinæmia

Blood for examination was prepared in the following way: 2 c cm. of blood was made up to 10 c.cm. with distilled water, and 1 c.cm. of saponin solution was added and the mixture centrifuged at 3000 revolutions a minute. Quantitative estimations of methæmoglobin were made spectrophotometrically. The absorption coefficient of each sample of blood was measured throughout the red end of the spectrum at intervals of 5 μμ. By comparing these at the wavelength where the absorption band is at its maximal density (634 μμ for methæmoglobin and 625 μμ for sulphæmoglobin) it was possible to represent graphically variations in the methæmoglobin and sulphæmoglobin content of the blood.

METHÆMOGLOBINÆMIA

In the following cases of pneumonia methæmoglobinæmia developed during treatment with 2 *p* aminobenzenesulphonamidopyridine and the effect of methylene-blue is illustrated

CASE 1.—A man, aged 38, was admitted suffering from lobar pneumonia with involvement of the right middle lobe. He was given 2-*p*-aminobenzenesulphonamidopyridine in doses of 6 g. daily. Cyanosis due to methæmoglobinæmia appeared on the second day of treatment and was intense on the third day. Methylene-blue 350 mg. was then administered by intravenous injection. Within ten minutes the leaden-blue colour of the mucous membrane and ears had given place to a bright healthy pink, and no methæmoglobin could be detected in the blood. Methæmoglobinæmia did not recur, although treatment with the drug was continued till the sixth day (fig. 2).

CASE 2.—A man, aged 42, was admitted to hospital suffering from lobar pneumonia involving the right lower lobe. He received daily 6 g. of 2-*p*-aminobenzenesulphonamidopyridine in divided doses of 1 g. every four hours. The blood on the third day showed the presence of methæmoglobin, and on the fourth day cyanosis was obvious After the intramuscular injection of 400 mg. of methylene-blue the methæmoglobinæmia disappeared. Treatment with the sulphonamide was not interrupted, and methæmoglobinæmia reappeared on the following day A daily dose of 1 g. of methylene-blue was then given by mouth for the next three days, and methæmoglobin disappeared from the blood and did not recur (fig. 3).

CASE 3.—A youth of 18 was admitted suffering from lobar pneumonia with involvement of the left

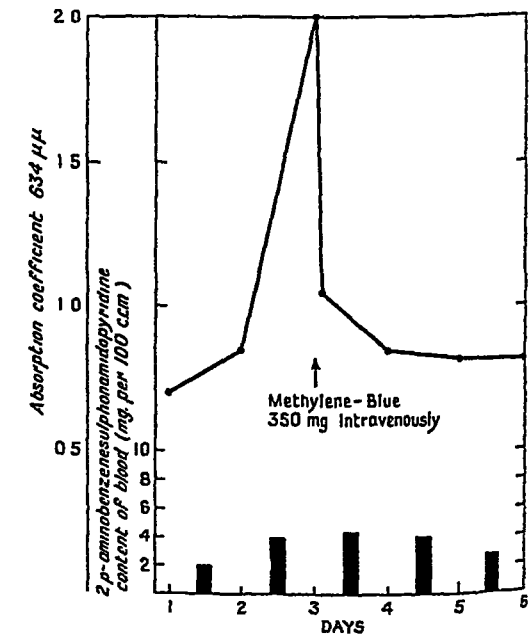


FIG 2—The effect of a single intravenous injection of methylene-blue in causing the disappearance of methæmoglobin in case 1

lower lobe. He did not respond to the administration of the usual daily dose of 6 g of 2-*p*-aminobenzenesulphonamidopyridine, and the estimation of the amount of the drug in the blood-stream revealed

very low values It was assumed that the drug was poorly absorbed, and the dose was increased by 2 g daily with a consequent increase in the concentration of the drug in the blood Coincidentwith this, methæmoglobinæmia appeared, and three days later cyanosis was intense Methylene-blue 150 mg was injected intravenously and caused such a rapid disappearance of the methæmoglobin that it could not be detected in the blood five minutes after the injection (fig 4)

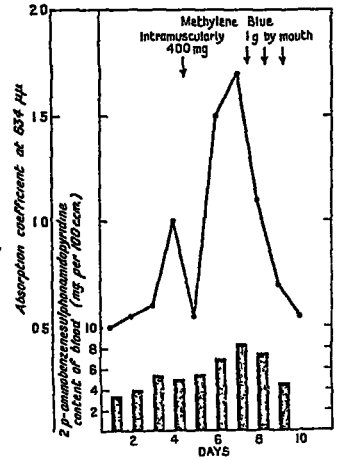


FIG 3—The action of methylene blue by intramuscular injection and by mouth in case 2

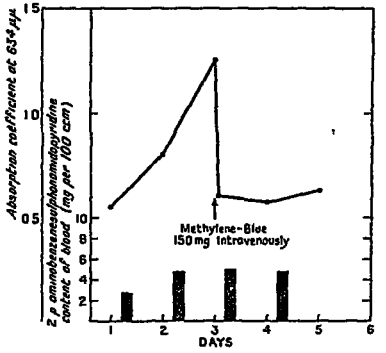


FIG 4—The effect on the absorption coefficient at 634 μμ of 150 mg of methylene blue given by intravenous injection in case 3

CASE 4 —A man, aged 38, was admitted to hospital suffering from lobar pneumonia Physical examination showed consolidation of the right lower lobe He received 2-*p* aminobenzenesulphonamidopyridine in doses of 6 g daily Cyanosis developed on the third day, and methæmoglobin was demonstrated in the blood This increased in intensity, and on the ninth day 360 mg of methylene blue was administered by intramuscular injection On the following day the cyanosis had entirely disappeared, and methæmoglobin could no longer be detected in the blood The administration of the sulphonamide was continued Methæmoglobin reappeared on the twelfth day, and on the fourteenth day cyanosis was again obvious He then received 1 g of methylene-blue daily by mouth for two days and at the end of that time the cyanosis had disappeared entirely The blood iron was estimated daily by the method of Wong and remained constant It must be assumed, therefore, that the disappearance of the methæmoglobin was due to conversion of this pigment to hæmoglobin and not to its destruction or excretion Fig 5 shows graphically the variation in the absorption coefficient of the blood at 631 μμ throughout the period of investigation

It can hardly be argued that the results obtained in these cases were due to a natural and spontaneous remission in the severity of the cardinal symptom, because we had previously found that, when methæmoglobinæmia developed during treatment with 2 *p* aminobenzenesulphonamidopyridine, the pigment could be detected in the blood four or five days after all trace of the drug had disappeared from the blood stream It is justifiable, therefore, to conclude that methylene blue actively converts methæmoglobin into hæmoglobin

It is of interest to record that methylene blue has a similar action on the methæmoglobinæmia produced by the administration of nitrites If 100 mg of sodium nitrite per kg of body weight is injected intravenously into a rabbit, well marked methæmoglobinæmia appears within half an hour If at this stage an intravenous injection of 10 mg per kg of methylene blue is given, methæmoglobin disappears from the circulation within five to ten minutes (fig 6*a*) Furthermore, the production of methæmoglobinæmia by sodium nitrite can be prevented by the simultaneous injection of methylene blue (fig 6*b*) The mode of action of the dye, which

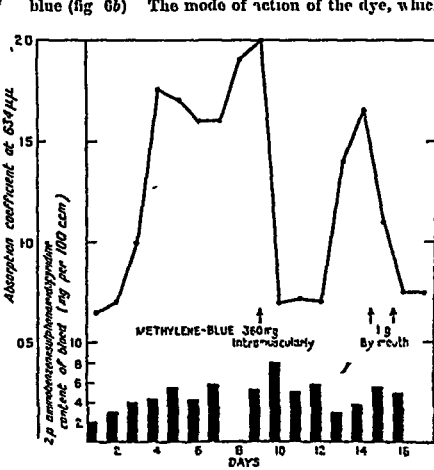

Absorption coefficient at 634 μμ
2-p-aminobenzenesulphonamidopyridine content of blood (mg per 100 ccm)
METHYLENE-BLUE 360 mg intramuscularly
1 g By mouth
DAYS

FIG 5—The action of methylene blue in causing the disappearance of methæmoglobin from the blood-stream when given by intramuscular injection and by mouth in case 4

in the tissues is reduced to the leuco compound, is presumably one of oxidation-reduction, the ferric iron of hæmoglobin being altered to the ferrous state.

The dye, as we have shown, is active when given by mouth. It is also slowly excreted After the oral administration of 1 g it can be detected in the urine for three or four days. A prolonged effect can

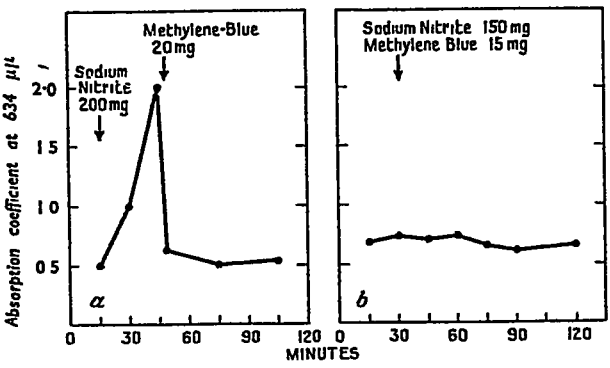


FIG 6—(*a*) The effect of methylene-blue in causing the disappearance of methæmoglobinæmia induced by the injection of sodium nitrite in a rabbit. (*b*) The effect of the simultaneous administration of methylene-blue and sodium nitrite No methæmoglobin appeared in the blood-stream.

therefore be obtained by giving it by mouth in divided doses several times a day In view of its action in preventing methæmoglobinæmia, it is well worth while considering the advisability of giving it as a routine along with 2-*p*-aminobenzenesulphonamidopyridine in the treatment of pneumonia and other infective conditions.

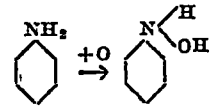
SULPHÆMOGLOBINÆMIA

In view of the results obtained in methæmoglobinæmia, the efficacy of methylene-blue was tried out in two cases of sulphæmoglobinæmia which developed after the administration of *p*-aminobenzenesulphonamide The dye was given intravenously and by mouth but was without effect Fig 7 shows that when 200 mg of methylene-blue was injected intravenously, the absorption coefficient at 625 μμ remained constant throughout the period of observation The oral administration of 0·5 g. thrice daily over a period of three days was also ineffective in altering the abnormal blood pigment

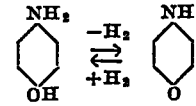
We found also that methylene-blue did not prevent the development of sulphæmoglobinæmia when administered along with *p*-aminobenzenesulphonamide. Two volunteers were given 1 g. of the sulphonamide three times daily, 4 g of confection of sulphur each morning, and 1 g. of methylene-blue daily in three divided doses In both cases the typical band of sulphæmoglobin appeared in the blood within forty-eight hours and was dense on the fourth day.

The mode of formation of sulphæmoglobin after the administration of sulphonamides has not been satisfactorily explained. Archer and Discombe (1937) have reported experiments which suggest that sulphonamide, by virtue of the C_6H_5N group, sensitises hæmoglobin to the action of hydrogen sulphide. We have been unable to find any evidence of a sensitising effect in experiments in vitro, though we have confirmed their results regarding the ease with which sulphæmoglobinæmia can be induced in man when sulphur is given along with *p*-aminobenzenesulphonamide, and we have found that the same thing may happen if 2-*p*-aminobenzenesulphonamidopyridine and sulphur are administered together.

According to Ellinger (1920) and Lipshutz (1920) aniline derivatives are oxidised in the blood to phenylhydroxylamine—



and Gley (1937) has suggested that it is this compound which is responsible for the formation of methæmoglobin and, in the presence of sulphide, of sulphæmoglobin He has shown that in vitro the addition to blood of a substance containing the hydroxylamine group results in the formation of methæmoglobin, but that, if a trace of hydrogen sulphide is present, sulphæmoglobin is formed Rimington (1939), however, thinks it unlikely that hydroxylamine is the methæmoglobin-forming substance, because of the ease with which it is oxidised in the tissues to azoxybenzene, and believes that it is the formation of *p*-aminophenol which is the important factor, because this substance is readily oxidised in the tissues to *p*-iminoquinone—



He points out, further, that this oxidation is reversible, and accordingly *p*-aminophenol will be able to form many times its equivalent of methæmoglobin

That this is a possible explanation of the formation of sulphæmoglobin as well is shown by the following experiment.—

To 5 c cm. of laked blood 3 drops of a saturated solution of *p*-aminophenol was added. Spectroscopic examination at the end of ten minutes showed the presence of methæmoglobin.

To another 5 c.cm. of the same laked blood 3 drops of a weak solution of hydrogen sulphide was added; in ten minutes no alteration in the blood pigment had taken place.

To a third 5 c cm. of the same laked blood 3 drops of a weak solution of hydrogen sulphide and 3 drops of *p*-aminophenol solution were added. At the end of five minutes a dense band of sulphæmoglobin was present.

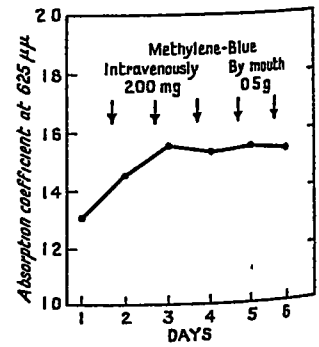


FIG 7—The action of methylene-blue by intravenous injection and by mouth in an established case of sulphæmoglobinæmia. No alteration in density of the absorption band took place.

It should be noted that the ease with which substances with a free amino group form sulphæmoglobin in the presence of sulphide is peculiar, because other agents which in vitro alter hæmoglobin to methæmoglobin—e g, sodium nitrite, potassium ferricyanide, and potassium permanganate—if added to blood containing hydrogen sulphide, produce sulphæmoglobin much more slowly

It is possible, therefore, to explain the specific action of aniline derivatives in forming sulphæmo

globin if we assume that they are changed in the tissues to *p* aminophenol, which leads primarily to the formation of methæmoglobin, but that, if sulphide is present during this process, the sulphide combines with the iron of hæmoglobin when in the ferric state and gives rise to sulphæmoglobin If this explanation is correct, the fact that methylene blue will not, as we have shown, prevent sulphæmoglobinæmia suggests that the dye does not really inhibit the formation of methæmoglobin but simply changes it fairly rapidly back to hæmoglobin, so that the abnormal pigment cannot accumulate in the circulation

CONCLUSIONS

(1) When examining blood spectroscopically for methæmoglobin, it is essential that the sample should be laked with only a small volume of water and examined soon after withdrawal Otherwise the presence of the pigment may not be detected

(2) In cyanosis developing during the therapeutic use of 2 *p* aminobenzenesulphonamidopyridine and *p* aminobenzenesulphonamide, where there is no other obvious cause, careful spectroscopic examination of the blood always demonstrates the presence of either methæmoglobin or sulphæmoglobin

(3) In methæmoglobinæmia, whether produced by 2 *p* aminobenzenesulphonamidopyridine or by sodium nitrite, methylene blue is effective in causing the rapid disappearance of the cyanosis by converting methæmoglobin to hæmoglobin

(4) The dye is active when given intravenously, intramuscularly, or by mouth

(5) It is suggested that the routine employment of methylene blue in conditions calling for the prolonged administration of 2 *p* aminobenzenesulphonamidopyridine may be a useful measure in preventing cyanosis

(6) Methylene blue has no effect in preventing or modifying the cyanosis of sulphæmoglobinæmia

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"We know that a mixture of blood is good for the race A periodic stirring of the cauldron mixes the ingredients and brings out qualities of mind and body which tend to stagnate, if left undisturbed too long The sack of Constantinople was followed by the renaissance The sack of Constantinople was followed by the renaissance of our cities be followed So, I hope, may the evacuation of our cities be followed by a re-awakening of rural England and the dawn of a new era of living planned on healthier and more spacious lines than those to which so many of our countrymen have become accustomed for there is little doubt that many of the refugees will never return"—Dr W A Lethem, medical officer at the Ministry of Health, speaking at the Royal Sanitary Institute Health Congress at Scarborough on July 5, 1939

EFFECT OF SULPHANILAMIDE ON THE BLOOD IN SCARLET FEVER

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AMONG all the enthusiastic and conflicting reports on the value of the sulphanilamide class of drugs one fact stands out clearly unpleasant and even fatal reactions have followed their use These effects are very variable in their nature, incidence, and severity Blood disorders take a high place among the unfortunate sequelæ of sulphanilamide therapy Ten cases of agranulocytosis have been recorded Plumer (1937), Borst (1937), Young (1937), Model (1937), Schwartz, Garvin, and Koletsky (1938), and Berg and Holtzman (1938) have reported fatal cases, and Jennings and Southwell Sander (1937), Tourtune, Durel, and Baudouin (1937), and Allen and Short (1938) reported cases in which recovery ensued Some observers have noted a depression in the leucocyte count not amounting to agranulocytosis (Johnston 1938) Several cases of acute hæmolytic anæmia following sulphanilamide therapy have been recorded (Harvey and Janeway 1937, Kohn 1937, Long and Bliss 1937, Wood 1938) and three of non hæmolytic anæmia (Jennings and Southwell Sander 1937)

The effect of sulphanilamide on the leucocytes has as yet received relatively little attention either from the experimental or the clinical aspect Marshall, Cutting, and Emerson (1938) found no change in the blood picture of four rabbits and two dogs after the administration of sulphanilamide Bigler, Chilton, and Werner (1938), who investigated the leucocyte response to sulphanilamide in 33 patients before, during, and after treatment, concluded that sulphanilamide seemed to cause a depression of the white blood cells, even to a point at which leucopenia developed, but that agranulocytosis did not develop with this depression of leucocytes Britton and Hawkins (1938) investigated the action of sulphanilamide on the leucocytes of 50 ambulant female patients Leucocyte counts of less than 5000 per c mm were recorded in 18 of these, and the authors considered that there was a polymorphonuclear *leucopenia in 16 per cent of their cases* The lymphocytes remained normal throughout, but monocytosis developed in 44 per cent of the patients and eosinophilia in 20 per cent Campbell (1938) found no change in the erythrocyte, hæmoglobin, and total leucocyte counts in the cases investigated by him He found that moderate doses of sulphanilamide stimulated a slight rise in the reticulocyte level, which is not necessarily associated with anæmia or leucopenia

Method of Investigation

During 1937 and 1938 a controlled series of 340 *cases of scarlet fever was treated with sulphanilamide* at Ruchill Fever Hospital, Glasgow Half of the patients received sulphanilamide treatment, while the remaining 170 were not so treated allocation to each form of treatment being determined solely by order of admission to hospital Observations were made on the blood counts of patients in this series It is not intended here to discuss the therapeutic effect of the substances used but merely to record the effect of sulphanilamide on the total blood count and on the differential blood count Of the 444

leucocyte counts made approximately half, and of the 56 differential blood-counts 30, were in patients treated with sulphanilamide. The results of these investigations are described and discussed

The amount of sulphanilamide given was large, and treatment was continued during the entire period of four weeks which constitutes the average time of detention of scarlet-fever patients in hospital The dose was as follows —

Patients 5 years of age or older were given 1 g. four-hourly—i.e., 5 g. daily—for the first fourteen days in hospital and then 1 g. thrice daily—i.e., 3 g. daily—for fourteen days. The average total dose was 112 g

Patients under 5 years of age were given 0·5 g. four-hourly—i.e., 2·5 g. daily—for the first fourteen days in hospital and then 0·5 g. thrice daily—i.e., 1·5 g. daily—for fourteen days. The average total dose was 56 g.

Concentrated scarlet-fever antitoxin was given to any patient who was thought to require it, irrespective of whether that patient was going to have sulphanilamide or not Of the 340 patients 269 were treated with serum The average dose was 20 c.cm., the least 10 c.cm., and the greatest 40 c.cm Of the patients receiving sulphanilamide 135 (79·4 per cent.) received serum, and of the controls 134 (78·8 per cent.) received serum. The patients showed an even distribution in respect of age-incidence, sex-incidence, and complications present on admission and developing later (French, to be published)

Results

The results recorded cannot be considered directly comparable with those of others who have made observations on the effect of sulphanilamide on the blood. The patients were all suffering from a condition which can per se cause a leucocytosis, and many had late complications which would tend to maintain that leucocytosis No attempt was made to examine the blood of selected cases systematically; the leucocyte counts were made at random, and it was hoped that an even distribution in respect of treatment, day of illness, and other factors would result from this method of selection, as in fact it did. The counts relate to scarlet-fever patients at all stages of the disease within the first four weeks, and there are a few observations made on patients after that period. It will be observed later that the leucocyte counts in the latter group are higher than normal. These patients all had some complication responsible for their longer period of detention in hospital and this complication probably caused the leucocytosis The action of sulphanilamide on the blood in this series of cases can only be studied by comparing the sulphanilamide cases with the control cases at the same period of the illness This was done and the results of the total leucocyte count, the differential leucocyte count, the red-cell count, and the percentage of hæmoglobin are shown.

TABLE I—TOTAL LEUCOCYTE COUNTS

	Sulphanilamide group		Control group		Difference (per cent.)	Standard error of difference
	No.	Per cent.	No.	Per cent.		
Total leucocyte counts made	211	100	233	100	—	—
Highest recorded count per c.mm	43,800		52,400		—	—
Lowest recorded count per c.mm	5200		7400		—	—
Counts under 5000 per c.mm	None		None		—	—
Counts between 5000 and 10,000 per c.mm	34	16·1	22	9·4	6·7	3·170
Counts between 5000 and 10,000 per c.mm in first week of illness—i.e., during period of high sulphanilamide dosage	15	23·0	5	6·3	16·7	5·912

TOTAL LEUCOCYTE COUNT

Table I shows the salient features of the observations on the total leucocyte count, fig. 1 the average leucocyte count at weeks in the form of a graph; and fig. 2 the average leucocyte count at three-day intervals in the form of a graph There are some statistically significant differences between the average total leucocyte counts in the control group and those in the sulphanilamide group, and all the available evidence points to a constant slight depression in the white-cell count in the cases treated with sulphanilamide A much higher percentage of counts in the sulphanilamide group did not show a leucocytosis, and this difference was very obvious indeed in the first week of the illness, when leucocytosis might be expected in practically all instances In no case did this depression of the white-cell count amount to a leucopenia, the estimations being well above the normal upper limit of 10,000 leucocytes per c.mm in a large majority of the cases investigated.

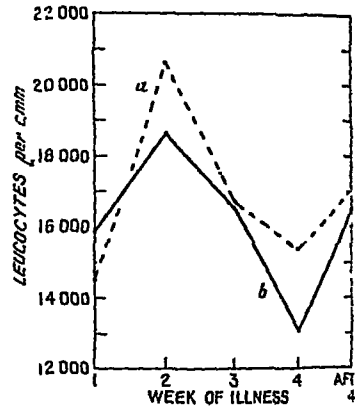

FIG 1—Mean leucocyte count at weekly intervals in scarlet fever: (*a*) patients not treated with sulphanilamide. (*b*) patients treated with sulphanilamide

DIFFERENTIAL LEUCOCYTE COUNT

Polymorphonuclear neutrophil leucocytes.—Since sulphanilamide is believed to have a toxic action on the bone-marrow, neutropenia was particularly sought for When the polymorphonuclear neutrophil cells were less than 60 per cent of all the white cells, this was considered to be below normal, and the following were the percentages in each group which gave this figure.—

Sulphanilamide cases	33·3 per cent
Control cases	15·3 "
Difference	18·0 "
Standard error of difference	11·31 "

Although this difference is statistically insignificant there appears to be some ground for the belief that sulphanilamide has a depressant action on the neutrophil polymorphs and hence on the bone-marrow

Large and small lymphocytes.—Although variations in the number of the lymphocytes are usually relative and depend merely on the number of polymorph cells, absolute increase is not unknown. Attention was paid to the lymphocytes in the following manner Cases in which the total leucocyte count was 10,000 or less per c.mm were ignored, for in them any percentage increase in the lymphocytes was probably due to a diminished polymorph count. All cases in which the total leucocyte count was 10,000 or more

per c mm , and in which the lymphocytes numbered 30 or more per cent , were considered to represent a true lymphocytosis This was found in 1 case in the control group and in 7 in the sulphanilamide group I do not know what is the significance of this finding, if indeed there is any Some of these cases with polymorphonuclear neutrophil counts of less than 60 per cent were included in those considered to have a neutropenia If the condition was to be regarded as a lymphocytosis this should not have been done, but it is difficult to know how it should be classified Wylie (1929) found a constant increase in the percentage of small lymphocytes in scarlet fever up to the seventh day of illness A brief summary of the counts showing lymphocytosis is given in table II

Mononuclear leucocytes —No significant change in the proportion of mononuclear leucocytes was observed in the cases examined The upper limit of normality (7 5 per cent of all white cells) was exceeded in 20 per cent of counts in the control group and in 15 3 per cent in the sulphanilamide group The difference is 4 7 per cent and the standard error of the difference 10 17

Eosinophil leucocytes —Of the control group 23 1 per cent of those examined were found to have

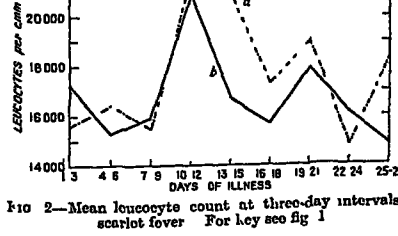

FIG 2—Mean leucocyte count at three-day intervals in scarlet fever For key see fig 1

more than 4 per cent of eosinophil leucocytes, the corresponding figure in the sulphanilamide group being 20 per cent The difference is 3 1 per cent and the standard error of the difference 11 01 The highest recorded eosinophil count was 16 5 per cent in a man, aged 23, who was in the control group and was treated with serum The count was recorded on the fifth day of a moderately severe uncomplicated attack of scarlatina simplex

TABLE II—CASES SHOWING LYMPHOCYTOSIS

	Total white cell count per c mm	Neutrophil polymorphs (per cent)	Lymphocytes (per cent) Large	Small	Total
Case in control group	19 700	58 0	13 5	22 0	35 5
Cases in sulphanil amide group	11 200	60 5	11 0	21 0	32 0
	10 700	55 5	11 0	23 0	34 0
	10,300	51 0	7 0	37 5	44 5
	12 400	69 5	7 5	23 0	30 5
	18,300	58 0	3 5	32 0	35 5
	12 400	40 0	17 5	31 0	48 5
	10 500	59 5	0 5	25 0	34 5

Three days later the eosinophil count had dropped to 5 5 per cent There was no history of asthma or other allergic manifestations

RED CELL COUNT

Sulphanilamide appeared to have a slightly depressant effect on the red blood cells The average counts recorded in each week of illness in the two groups are shown in table III

HÆMOGLOBIN

Sulphanilamide was found to have no apparent effect on the hæmoglobin The average readings recorded in each week of illness in the two groups are shown in table IV

TABLE III—RED CELL COUNTS IV—HÆMOGLOBIN

Week of illness	Red blood-cells per c mm		Hæmoglobin (Sahli) (per cent)	
	Sulphanil amide group	Control group	Sulphanil amide group	Control group
1	5,180,000	5,320,000	101 0	97 4
2	4,090,000	5 323,000	90 1	95 3
3	4 893,000	4,490,000	91 6	86 0
4	4,958,000	5,315,000	97 0	87 0

Discussion

These observations show that sulphanilamide had little deleterious effect on any element of the blood except the polymorphonuclear leucocytes In the patients treated with sulphanilamide a slight but constant depression of the total white cell count was observed at all periods of scarlet fever, especially in the first week Differential counts showed that this was due to a diminution in the neutrophil polymorphs Although this depression never amounted to an actual leucopenia, it is easy to imagine that in a patient with a grave infection, in whom the marrow is already depressed, the administration of sulphanilamide may have the unfortunate effect of bringing about the serious state of agranulocytosis It seems very significant that, in the sulphanilamide group, 23 per cent of those examined in the first week of illness did not show a leucocytosis, whereas the corresponding figure in the control group was only 6 3 per cent After the first week the occurrence of leucocytosis is too variable for its absence to have the same significance

I am greatly indebted to Dr W M Elliott, physician-superintendent of Ruchill Fever Hospital, for permission to publish these results

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FRACTURED PATELLA TREATED BY EXCISION OF THE FRAGMENTS

By HAROLD DODD, Ch M. Lpool, F.R.C.S.

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WHEN Ralph Brooke advocated treatment of the fractured patella by excision of the fragments in 1937, the surgical world was startled. It caused a similar effect on Prof. Hey Groves, the editor of the *British Journal of Surgery*, for he travelled to see Brooke's actual patients and then, stimulated to study the matter with Prof. Whitnall, he wrote a note on the anatomy and mechanics of the patella confirming the soundness of the principle (Groves 1937) Since then Gordon Tippett (1937) and others have published successful cases.

This note gives details of my first five cases of fractured patella treated by excision of the fragments, and adds a short commentary on the method. My interest in the fractured patella was inspired in 1930 by my colleague Mr. A J. Couzens, F.R.C S., who had developed an effective technique for wiring and after-treatment. This wiring and postoperative care was satisfactory and patients walked home on the 14th day, but full function of the knee-joint was seldom completely regained. Various troubles were encountered—for instance, sinuses developed and the wire or plaited silk required removal; the fragments separated, or their position after being satisfactory became disturbed; the knee was occasionally stiff, for bony union was always tedious and uncertain and until it was attained vigorous muscular exercise and forcible measures to gain full movement were inadvisable. Flexion was generally limited, a degree of swelling persisted, and pain and fatigue were not uncommon

When Brooke reported his convincing treatment by excision of the fragments, I adopted it, and the results have fulfilled the high expectations The patients are restored to normal although their age in three cases was 72, 60 and 60 The patients were shown at a medical meeting and from their function it was not possible to detect the injured knee.

Case 1: eight months after fracture of right patella.

CASE-RECORDS

CASE 1.—A man aged 72 sustained a fractured patella in a motor accident on Oct 27, 1937. Operation on the 30th. Percaine spinal anæsthesia. A tourniquet was applied. Transverse incision over the gap between the fragments. Fragments found to be widely separated and the quadriceps tendon grossly shredded Fragments excised and quadriceps sutured No difficulty in closing the gap. He was discharged on the 14th day He now has no disability but has experienced a little trouble with varicose veins which were present before operation and have been treated by injection. He had difficulty walking upstairs at first.

CASE 2.—A man aged 60, a window cleaner, fell 22 feet from a ladder, cut his chin, fractured his right tibia and fibula at the ankle-joint and his left patella (compound) on May 14, 1938. Operation later in the day (chin and ankle had already been dealt with) Local infiltration anæsthesia with Pantocaine 1 in 1000 about the patella. Found to have small lacerated wound over the patella and four or five widely separated fragments of the kneecap. Skin wound was excised and extended into a transverse incision Patella was excised and quadriceps tendon sutured with interrupted sutures. Uneventful recovery, almost full function in three weeks This leg is now much better than the other which sustained the Pott's fracture.

CASE 3.—A woman aged 60 fractured her patella without deformity on Oct. 22, 1938. Operation on the 29th under spinal anæsthesia Transverse incision Quadriceps tendon was intact; it was reflected laterally from the fragments and sutured. Patella excised. She was up on the 12th day but had a fainting attack. Went home on the 21st day and now has no disability. Going up and down stairs presented some difficulty for 2 months, but she was unusually apprehensive.

CASE 4.—A woman aged 30 fractured her patella in a motor accident on Nov. 20, 1938. The fragments were not separated. Operation on Dec. 13. Fragments excised and tendon sutured. She walked home on the 14th day and regained stability and mobility almost at once.

CASE 5.—A man aged 35 slipped on the ice and fractured his left patella with wide separation on Dec. 30, 1938. Operation on the 31st under local infiltration with pantocaine. Fragments excised and tendon sutured He returned home on the 14th day and to work on the 30th day.

To summarise these cases, three men and two women aged 72, 60, 60, 30 and 35 have been treated The fragments were widely separated in three and were in apposition in two Interrupted No. 40 thread sutures were used in each and healing was by first intention although one was a compound fracture. Massage and exercises were used in only one case and then as a placebo.

THE OPERATION

The operation is carried out as soon after the accident as the patient's condition permits If possible it is done on the day of the accident This early repair after the injury has been practised since 1930 and no ill effects have followed it The anæsthetics used have been a general once and spinal and local infiltration twice each, the amount of injection necessary to make the latter effective is surprising, a unilateral spinal is probably the ideal

Technique—A tourniquet has been applied occasionally, it is not essential. The incision is a generous transverse one extending well beyond the lateral borders of the patella in order to expose the quadriceps expansion. It is placed midway between the fragments when they are separated or across the centre of the patella if there is no displacement. The hæmatoma in the wound and in the knee-joint is always large and is turned out. The fragments are "filleted" from the shredded quadriceps tendon—a slow and finicky proceeding. The patella is best held with a piece of sterile gauze. The edge of the scalpel is kept cutting on to the bone in order to preserve the tendon as much as possible. The quadriceps expansion is closed by a series of two-hitch interrupted sutures; these do not tend to cut out of the tendon. The thread is tied only when all the stitches are inserted. A little difficulty has been encountered twice *in closing the gap in* the centre, for the tissue has been so fragmented and shredded. Numerous interrupted fine thread sutures (No. 90) were required to "darn" the deficiency soundly with the shreds available. The deep fascia is closed, and then the skin is sewn up with interrupted stitches.

Dressing—A Robert Jones bandage, with at least six alternate layers of wool and bandage is firmly applied, and the limb is loosely tied to a soft head-pillow.

Aftercare—The recovery has been uneventful in all the cases. The pillow is removed on the 5th day, and the patient is encouraged to move the leg in bed and to bend it as much as the dressing allows. *On the 7th day the exercise is increased to sitting up* with the legs over the side of the bed bending and actively swinging them. One layer of bandage and wool is removed per day from now on, *so increasing* the range of flexion, and the use of the limb and foot is diligently pursued. On the 10th day patients get up, put on outdoor shoes (not *slippers*, an important point to avoid a flat foot), and walk with the aid of an assistant and a stick. On the 12th day the stitches are removed and on the 14th day the patients go home. The joint is protected and kept warm by a woollen kneecap, worn day and night. Steadily increasing walks are taken daily and in addition the following exercises are practised, two or three times a day—

(1) Marking time, lifting the knees *high on to the* abdomen.
(2) Swinging the leg back and *attempting* to kick the buttock with the heel while standing, first one and then the other.
(3) Alternate *standing* on the toes and on the heels.
(4) Bending the knees until the patient is sitting on the *heels*.
(5) Kicking the feet forward as high as possible.

No massage is required. These exercises are designed to develop both stability in the limb and mobility in the joint. The *photographs* shown in the figure illustrate how this has been attained, the positions were unrehearsed. The reader is invited to hold this posture while a camera is focused and a snap taken, it will probably be conceded that it constitutes a fair test.

The advisability of *removing* the patella in the absence of separation *will doubtless* be questioned. Its justification is the relief of pain and early return not only to getting about with active unsplinted use of the knee but also to work. Against it is the risk of opening the knee joint, but this factor is to a large extent known and preparations can be made to minimise it.

Incidentally it may be added that good results are reported from excision of the patella in osteo arthritic knees.

SUMMARY

The treatment of fractured patella by excision of the fragments has proved highly satisfactory. The technique is straightforward, patients soon return to work, and full function of the knee is restored.

In five cases, three being over 60, recovery was uneventful.

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COMPLETE FREEDOM FROM DENTAL CARIES

A COMPARATIVE STUDY OF TWENTY-FIVE CHILDREN

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DENTAL caries is so widespread among human beings that it has come to be considered almost a normal perquisite of civilisation. Even in school children investigations have repeatedly shown an incidence of over 90 per cent., and a really sound set of teeth in an adult is practically unknown. The very universality of the disease makes its ætiology all the more obscure, and the factors which have been implicated at one time or another are many. Briefly, at the moment, medical and physiological investigators are inclined to favour some general cause, in part at any rate a nutritional deficiency, whereas the dentists are more interested in the mechanics of the immediate cause and accordingly lay more emphasis on local factors—dental irregularity, carbohydrate fermentation, changed salivary pH, and defective oral hygiene.

In an endeavour to trace some of the grosser causal factors we made an intensive study of a group of children between the ages of ten and fourteen, with caries-free mouths and no history of caries in the permanent dentition, and compared them with a group showing gross caries but similar in other respects.

We discovered that an investigation on somewhat similar lines had recently been carried out in Leeds by Read and Knowles (1938), who had studied the diet and habits of two groups of 12 similarly selected children. They did not specifically mention inquiry into the family dental history or the personal history of illness, and they did not examine the teeth and inquire into the circumstances of the brothers and sisters of the children in their two groups. On the other hand, they worked out the present dietary of the children in considerable detail. Careful upbringing, *an adequate diet with good protein content and daily* fresh fruit and milk, regularity of meals, limited intake of ferment-able carbohydrate and adequate oral hygiene were among the factors they found to favour freedom from dental caries. They found economic circumstances in the two groups so variable as to be inconclusive, and they observed the relatively low incidence of caries among the inmates of an orphan institution.

PRESENT INVESTIGATION

We classified the severity of dental caries as follows:

	Average number of cavities
A, complete absence of caries	0
B*, very nearly perfect	1
B, slight to moderate caries	2
C, moderate caries	4
D, moderate to bad caries	7
D*, very bad caries	12
E, extreme caries involvement of practically every tooth	20

As a first step, 1842 children, aged ten to fourteen, in Newcastle elementary schools were examined by one of us (D. M R C) and the results tabulated thus:—

A	B*	B	C	D	D*	E	Total
25	88	407	810	451	55	6	1842
(1·3%)	(4·8%)	(22%)	(44%)	(24·4%)	(3%)	(0·3%)	(99·8%)

The 25 children in group A and 25 taken from group D* formed the material for a more detailed study (The latter 25 were selected from the total 55 by taking those attending schools nearest to the place of examination) These 50 children, with their mothers and as many of their brothers and sisters as could be mustered, attended the Raby Street dental clinic of the Newcastle education committee Their mouths were again carefully examined and charted, and a detailed personal and family history of all the children (dental, dietetic, and general) was taken Over 100 children were thus examined, and the mother's health during pregnancy, circumstances of birth, family history, income and housing conditions, infant-feeding, present diet, habits, and past pathological history were investigated in as great detail as possible, the information sometimes being augmented by a visit to the home

RESULTS

A comparison of the social state of the two groups of 25 children gave the following figures:—

	A	D*
Total average weekly income per head of family	10*s* 2*d*	10*s* 6*d*
Average number of live children in family	4·01	4·20
Rooms	3·6	3·1

The chronological distribution of the 25 A and the 25 D* children within their 50 families showed some interesting differences:—

	A	D*
Eldest child in family	15	8
Second child	4	4
Third child	6	5
Fourth or later child	0	8

In other words, A children were often the elder children of the family, whereas the D* children were more often younger children of a family with considerably older brothers and sisters It is difficult not to associate this apparently higher incidence of caries in the younger children of the family with the working-class mother's frequent complaint that *her* teeth were "fairly good until she started having children" Such an association might possibly be related both to maternal calcium exhaustion from the demand of repeated pregnancies and to the unfavourable economic position of the later children in families with relatively fixed incomes

Examination of the teeth of the younger brothers and sisters of the children in the two groups revealed the distinctly familial incidence of dental caries (see table I) (It was possible to examine only these younger sibs mainly attending the same school) Table I shows that 58 per cent of the brothers and sisters of the A children were A, B*, or B, as against 4 per cent. of the D* brothers and sisters, and 96 per cent of the brothers and sisters of the D* children fell into the C, D, or D* class as against 42 per cent. of the A brothers and sisters.

Inquiry into the family dental history elicited the following facts: a strikingly good history on both sides—e g, mother's teeth excellent, grandfather a "sound" head of teeth at 70—was found in 9 A children and 1 D child, and a strikingly bad history on both sides—e g, mother had false teeth at 17, father at 23—was found in 8 D children but no A children The D child with a good history had feeding difficulties and rickets; but in this connexion it is interesting to compare the results of re-examination (by D M R C.) of the 177 children in the Ponteland (Newcastle-upon-Tyne education committee) children's home, not otherwise included in this series but previously the subject of study from other angles by one of us (Miller 1938) which yielded the percentages shown in table II. These figures for the Ponteland children's home compare very favourably with those recorded for any community living under civilised conditions and, together with the fact that most of the caries present was slight or tended towards arrested decay, indicate that any hereditary tendency which may exist is susceptible to improvement in environment even after the age of three years, the age at which children are admitted to the children's home

TABLE I—FAMILIAL INCIDENCE OF DENTAL CARIES

State of teeth	A children's 26 brothers and sisters seen	D* children's 25 brothers and sisters seen	1842 school children
A	1 (4%)	0	1·3%
B*	4 (15%)	0	4·8%
B	10 (39%)	1 (4%)	22·0%
C	5 (19%)	9 (36%)	44·0%
D	5 (19%)	7 (28%)	24·4%
D*	1 (4%)	8 (32%)	3·0%
E	0	0	0·3%

TABLE II—COMPARISON OF INCIDENCE OF DENTAL CARIES

State of teeth	Ponteland children's home		Newcastle schools
	177 children aged 3–18½	115 children aged 9–15	1842 children
A	25·9	27·8	1·3
B*	10·7	12·2	4·8
B	32·2	32·2	22·0
C	21·4	20·0	44·0
D	9·6	7·8	24·4
D*	0	0	3·0
E	0	0	0·3

The inquiry into infant feeding indicates that breast-feeding and perhaps, to some extent, supplementary vitamins appear to be factors in determining later freedom from dental caries.—

	A	D
Breast-fed, wholly or preponderantly until nine months or later	22	15
Artificially fed	3	10
Additional cod-liver oil	11	4
Additional orange juice	14	9

The difference shown by Read and Knowles (1938) to exist between the present diets of their two groups was

so distinct that we hoped to demonstrate such a difference by relatively crude methods of inquiry, but, beyond showing a 50 per cent higher habitual consumption of "fresh" milk (practically all the milk used by both these groups was pasteurised) in the caries free group, our results by such methods were inconclusive Indeed it appears practically impossible to obtain by any method short of direct observation even a moderately accurate qualitative and quantitative dietary history in a human being beyond the age of infancy

In view of the often repeated assertion of a relationship between irregular dentition and caries, the mouths were charted and the following results obtained —

	A	D
Regular dentition	9	9
Very irregular dentition	4	6
Others (not perfectly regular)	12	10

Similarly unconvincing were the findings with regard to oral hygiene 16 of the 25 children with perfect teeth had never used a toothbrush regularly, and 12 not at all

Perhaps the most interesting findings are yielded by inquiry into the histories of past history of common illnesses —

	A	D*		A	D*
Measles	22	20	Pneumonia	2	7
Measles complicated by bronchopneumonia	0	3	Diphtheria	1	0
Pertussis	8	13	Scarlet fever	2	1
			Chronic cough	3	8
			Rickets	0	7

The average age incidence of measles was 4·5 years and of pertussis 5·5 years in group A, and 3·2 and 3·4 years respectively in group D*, and cases of measles in children under 4 years numbered 8 in group A and 14 in group D* The incidence of other past illnesses in the two groups is also very illuminating —

	A	D*		D*
Acute appendicitis	1		"Anæmia"	4
"Tonsils and adenoids	1	4	Chronic abscesses	1
Diabetic (12 months history on 150 g of carbohydrate and insulin)	1		Meningitis	1
			Bronchiectasis †	1
Mastoid		2	Empyema	1
Tuberculous glands		1	Coeliac disease †	1

† Confirmed by hospital investigations

These figures reveal a spectacular amount of past illnesses among the 25 D* "normal" children picked out from their 1842 fellows for examination solely on account of their dental condition Although in some cases the onset of noticeable caries seemed to be directly traceable to some severe illness, no causal relationship can be defined on the basis of this data Nevertheless, reviewing the whole series of cases and the ages at which the illnesses occurred, it is difficult not to conclude that thus high incidence of illness was probably a causal factor in the development of caries Even the maternal health during pregnancy is shown to be different in the two groups —

	A	D*
Toxæmia of pregnancy	1	5
"Unwell" during pregnancy, ranging from anæmia and malnutrition to tuberculosis	0	6

SUMMARY

Examination of two groups of 25 children between the ages of ten and fourteen, one group with complete freedom from dental caries and the other group suffering from gross caries demonstrates certain factors which were apparently associated with freedom from dental caries (1) good family dental history (not apparently of such significance as good general hygiene and diet), (2) careful infant feeding, especially breast feeding, and, probably above all, (3) absence of severe illness and an early incidence of infectious fever No difference of present economic status was demonstrable between the two groups, but a point of importance appeared to be that children with bad teeth were often the younger members of a family, whereas those with good teeth were frequently first children In this series of cases irregular dentition and inadequate oral hygiene did not appear to exercise any unfavourable effect on the degree of freedom from caries

We wish to thank Dr G C M M'Gonigle and Dr J C Spence for helpful criticism and advice, and the Newcastle upon-Tyne education committee for the facilities afforded to us

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

AT a meeting of this section held on July 6, Mr CLAUDE FRANKAU being in the chair, Dr GORDON MURRAY, of Toronto, read a paper on

Heparin in the Prevention of Thrombosis

The properties of heparin as an anticoagulant had, he said been discovered in 1916, he had become interested in it because of the help it afforded in experimental work on blood vessel anastomosis One of the most important steps had been the obtaining of heparin in a pure state whereby its toxicity had been eliminated The *crystalline barium salt* which had been produced had a constant potency Opinions differed as to whether heparin was an antithrombin or an antiprothrombin It might be injected subcutaneously, applied to surfaces, or injected into vessels In vessels its action might be restricted to a length of vessel, or, by injection into the general circulation, it might act by altering the clotting time of the blood This general effect had been found the most useful Veins and arteries could be divided and sutured under the influence of heparin, Dr Murray gave illustrations of perfect healing with complete patency and no evidence of clotting Without the use of heparin, such results were rare, with heparin they occurred in over 90 per cent of cases In grafting experiments—e.g., *of a length of jugular vein into a gap in the carotid* artery—without heparin thrombosis occurred every time within three hours, with previous administration of heparin for 7–9 days by constant intravenous drip—admittedly a difficult procedure to carry out successfully in animals—complete patency of the grafted vessel was assured Dr Murray had followed the histological changes in these grafts up to one year after the operation and was able to demonstrate how the grafted vein gradually assumed the characters of the artery A thrombus produced experimentally by insertion of a foreign body at the bifurcation of a peripheral artery, such as the femoral, could be successfully removed in the heparinised animal

even after it had remained in situ for twenty-four hours and had become attached to the intima Experiments on the splenic vein suggested that heparin had a similar anticoagulant effect in the portal system; in the transplantation of organs also heparinisation ensured success One valve of a heart had been removed and a new valve substituted and the animal continued to live without thrombus formation in the heart

Clinically, heparin had been given by continuous intravenous drip to more than 400 patients without toxic effects; superficial veins near the wrist were used, and no vein had thrombosed up to two weeks. Without heparin it was usual for the veins to thrombose at the end of 26–48 hours. As a preventive of postoperative thrombosis and pulmonary embolism he thought heparin was of value It had been found that the incidence of pulmonary embolism in 600 major operations was 2 per cent , in 400 cases in which patients received intravenous heparin after operation no case of pulmonary embolism occurred Embolectomy was a field of surgery where the use of heparin had been most helpful; 60 per cent. of these operations were successful in heparinised patients The heparin was administered twenty-four hours after the operation, so as to guard against undue bleeding at operation. The clotting-time returned to normal in one and a half hours, and there was no negative phase later on.

In 72 cases of thrombophlebitis in which heparin had been administered the results had been impressive Pain, temperature and œdema had rapidly subsided. The clot was not absorbed In pulmonary embolism Dr Murray claimed no operative success, but in some cases of repeated embolism he believed that heparin had proved of value in preventing further attacks In mesenteric thrombosis, necessitating large bowel resection, success was rare; he had seen only one case recover. But four consecutive cases were alive and well in which the resection had been done and heparin administered. Two subsequent cases died, one after nine days, from peritonitis In splenectomy and in blood-transfusion heparin had proved its value, and there might be a field for its use in coronary thrombosis. The rationale of its use in coronary disease was not clear, but if it were true that occlusion at the commencement was incomplete then heparin might prevent complete occlusion In cases in which heparin had been used all they could say was that the clinical course and the electrocardiograms had been unusual. He described a case in which he had excised a popliteal aneurysm and grafted a length of the jugular vein to re-establish the continuity of the artery The patient subsequently developed an aneurysm in the lower end of the venous graft. This was sutured and the man returned to the Bush with a perfectly normal leg.

Summing up, Dr Gordon Murray said it was proved that heparin was non-toxic, both in animals and human beings; that it prevented thrombosis; that it was valuable in determining success in operations on blood-vessels, and in cases in which thrombosis was a feature.

DISCUSSION

The CHAIRMAN confirmed the value of heparin in the operation of embolectomy. He congratulated Dr. Murray on the brilliance of his work, which he said was well recognised in Toronto

Mr. G. GORDON-TAYLOR said he did not feel so despondent as Dr. Murray about mesenteric thrombosis: almost half his cases had recovered

Sir JAMES WALTON said he knew of no piece of experimental work in surgery which had been so rapidly and successfully carried through or so rapidly applied to clinical use as had Dr. Murray's.

In reply to various speakers, Dr MURRAY said that there was still great difficulty in assessing accurately the heparin content of blood; possibly however in cases with thrombosis the heparin content might not be a significant factor In Toronto they had found it best to determine the individual clotting time for a patient and aim at doubling or trebling that, rather than at producing a standard clotting time. The simplest possible method of estimating clotting-time had proved the most satisfactory, they had given up complicated machines The average case required 750–1000 units of heparin per hour intravenously. The price of heparin was as real a difficulty in Toronto as here; he was afraid it would not be appreciably lower till a synthetic preparation came on the market. There had been successes in septicæmic cases—as, for example, in septicæmia following carbuncles, and physicians were hoping that heparin given in vegetative endocarditis might prevent the thrombus forming on the valve and thus destroy the nidus for the growth of organisms.

OXFORD OPHTHALMOLOGICAL CONGRESS

As is now customary, this congress gathered at Keble College, Oxford, where on July 5 the members met informally and dined in hall The discussions and demonstrations took place at the School of Anatomy, beginning next day with the installation of Mr. PERCIVAL HAY (Sheffield) as master, in succession to Dr C. G. RUSS WOOD, who died shortly after last year's meeting.

Chiasmal Lesions

The Doyne lecture was delivered this year by Mr F. A. WILLIAMSON-NOBLE (London), who took as his subject the Ocular Consequences of Certain Chiasmal Lesions The characteristics of the chiasmal syndrome, he said, include defective central vision, optic atrophy (with or without papillœdema), and very numerous and varied defects of the visual field. The common causes are.—

(a) *Meningiomas* which grow from the dura covering the circle of sinuses surrounding the pituitary diaphragm As they enlarge, these raise the chiasma and stretch both it and the optic nerves. Irregularity of pressure accounts for corresponding asymmetry of the field defects.

(b) *Suprasellar pituitary adenomata* occur either as outgrowths from the stalk of the gland, or from its upper part. In either case there may be a strange absence of signs at first, the most likely evidence being field changes Small test objects and the use of the two-metre screen are valuable in this connexion

(c) *Craniobuccal pouch cysts*, enlarging from remnants of the hypoglossal duct, form a third group They are commonest in childhood, and tend to calcify.

(d) *Arachnoiditis* of the chiasmal region may arise from many causes. The clinical features appear as the result of adhesions or cyst formations. General neurological findings may be absent.

(e) *Aneurysms of the circle of Willis* arise and yield signs after the age of 30 as a rule. Suddenness of onset and pain are the chief features. Radiography may reveal calcification in the aneurysmal wall.

(f) *Chiasmal glioma* is rare. The age-period is youth and there is a tendency towards enlargement of the optic foramina.

Where adhesions develop—e g in syphilitic complications—their division may lead to great improvement of vision by stopping the otherwise inevitable advance of pressure atrophy

Mr Williamson Noble paid tribute to those who, through the media of anatomy, pathology, radiology and perimetry, have helped to provide a reasonable chance of preoperative differentiation, although even now many cases remained unclassified until operation adds certainty to the diagnosis

Vital Staining

Mr ARNOLD SORSBY (*London*), in a demonstration of vital staining, explained that although it has been held that a blood brain barrier resists the vital staining of the brain and its associated element the retina, this is not really correct The reason why the retina does not take stain well is that it has a very high oxygenating capacity If this is impaired by retinal disease, staining will take place according to the degree of the damage In a case diagnosed as retrobulbar neuritis because damage to one optic nerve was seen with the ophthalmoscope vital staining demonstrated damage to the other optic nerve and the condition was traced to a pituitary tumour

Orthoptics

The value of orthoptic training in cases of heterophoria came under heavy cross fire some sang its praises but some thought it an extravagant means of doing what (they maintained) could equally well be done by careful refraction, occlusion of one eye, and attention to physical health

The case for orthoptics was opened by Mr KEITH LYLE (London), while a critique of the method was delivered by Mr F W LAW (London) Much of the argument ranged round the question whether there is any great advantage in educating vision up to the full appreciation of stereoscopic consciousness It is well recognised, as Mr Law pointed out, that many members of the community pass their lives with the comfort of binocular vision but without its higher refinements He granted nevertheless that the arrival of orthoptics has allowed the ophthalmic surgeon to ascertain the exact binocular state of a patient, and that this is a very useful guide for attack upon the squint by surgery It has helped also in the assessment of prognosis The discussion brought out the fact that in heterophoria orthoptic exercises are capable of giving immense relief from headache, strains, and potential neuroses

Other speakers were Miss SHEILA MAYOU (London), Wing Commander P C LIVINGSTON (London), Dr E B ALABASTER (Birmingham), Mr GEORGE BLACK (Leeds), Dr H CAMPBELL ORR (Wolverhampton), Mr P J LLANS (Birmingham) Mr O M DUTHIE (Manchester) and Mr BERNARD CHAVASSE (Liverpool) Miss MARGARET DOBSON (London) showed a film illustrating orthoptic training in cases of convergent concomitant strabismus

The Aqueous Humour

Dr J DOUGLAS ROBERTSON (London) read a paper entitled The Aqueous, a Secretion As a biochemist he has satisfied himself that work is done and energy expended in the formation of the fluid, that a specific substance can be isolated from it, that a chemical equilibrium between blood and aqueous resembles that between blood and a secretion, and that the interchange over the blood aqueous barrier resembles that over the membrane between the blood and the gastric juice, and not that over the capillary intervening between the blood and interstitial fluid

Miners' Nystagmus

Mr T HARRISON BUTLER (Birmingham), in describing miners' nystagmus, laid greatest emphasis upon the toxic and psychasthenic influences at work, and maintained that the miner in general is a highly strung person—partly because of the prevalence of inbreeding in mining communities The toxic influences, he said, emanate from methane, while the neuroses are favoured by the fear of unemployment and by subconscious apprehension of accident It was most exceptional to find a case of miners' nystagmus that could be attributed to deliberate mimicry He doubted whether there is ever a complete recovery in those cases that have endured for some time

Dr DOUGAL CALLANDER (Doncaster) said that when work is good and wages are high the case rate falls sharply away He thought recurrences are rare if the men are given immediate and suitable work above ground

Mr HERBERT CAIGER (Sheffield) spoke of the presence of an inhibitory factor within the cerebral arc, which prevents the onset of acute symptoms even when oscillations are to be seen It is when this natural compensatory mechanism breaks down that the trouble starts On the legal issues, both coal owners and colliers have had grounds for complaint He agreed with Mr Harrison Butler that the perpetual use of the term "miners' nystagmus" is bad, so also is "miners' neurosis"

Sir ARNOLD WILSON, M P, concurred, and said he felt that the cure did not lie with the oculist, but rather within the scope of the physician with expert knowledge of psychology Posture at the coal face has possibly, he thought, been too much neglected

Mr W J W FERGUSON (Sheffield) described experimental studies showing that very bad lighting could be a contributory cause

Protection of the Eyes

Sir ARNOLD WILSON, in a paper on workmen's compensation and disability schedules, spoke of the need to employ protective goggles wherever the eyes are exposed to injury, be it intense light, heat, or flying metal The exhibition of protective shields and tinted glasses on all suitable occasions is important, since it helps the employer of labour to select proper protective materials

Sir ARNOLD LAWSON (London) gave a paper on the application of tinted glasses to industrial and other purposes, and accompanied it by a demonstration of the effects of different coloured filters combined with suitable metal bases (iron or cerium) upon the various components of the spectrum He discussed the influences of these in industry, aviation, and sun glare, and mentioned Crookes, Neophan, and Polaroid He remarked particularly that Protex glass has a strong influence upon the infra red end of the spectrum The problem of glass blowers' cataract is he said, still with us, although glass blowing by hand is now dying out

Miscellaneous Communications

Dr BERNARD SAMUELS (New York) spoke on drusen of the retina H Müller (1858) was first to describe these bodies they are found both in the choroid and optic nerve but only very rarely in the retina He described the histology of the rare type coming from the glial cells of the retina Poor nourishment and irritation are factors in their production

Mr J W TUDOR THOMAS (Cardiff) showed a series of photographs of the results of corneal grafting In one case the donor eye had been enucleated over a

hundred miles from the patient operated upon, and the result was entirely successful Success can be got by using the corneas of cadavers, but actually in one or two attempts of this kind he had not been successful. The cases selected, however, were not promising.

DR LA ROCCA (New York) showed a film of a new method of stitching when operating with corneal grafts.

MR F. E. PRESTON (London) demonstrated a new unobtrusive occluder for raising the vision of amblyopic eyes, and for other cases in which it becomes necessary to occlude. It presents a better appearance than do black shades and entirely opaque glass screens Its value in amblyopia was doubted by some members on the ground that it does not sufficiently eliminate vision.

MR P G DOYNE (London) gave a short communication entitled Number Forms It seems that about one person in thirty sees numbers as patterns of weird shape, curved or angular, with some of the groups accentuated They are set in space as a picture by visual memory They are thought to be caused by such things as the remembered arrangement of clock faces during infancy, and tend to persist in the proportion stated This method of figure visualisation is thought to account for the phenomenon of lightning calculation Those who do not see figures in this way find the process quite beyond their understanding

MR THOMSON HENDERSON (Nottingham) put forward the question, How is a hyphæma or a hypopyon resorbed? He maintained that extensive section-cutting of the eyes of mammals reveals no anatomical barrier at the angle to prevent the free passage of aqueous into the suprachoroidal space He is convinced that this is the normal physiological drainage route of the aqueous

The annual dinner was held on July 6, when there was an attendance of about 130, including Prof. R. R. Macintosh (Oxford) as guest of honour Mr. P. H. Adams (Oxford) acted as deputy master of the congress and Mr F. A Anderson (Shrewsbury) as hon. secretary.

SOCIETY FOR THE STUDY OF INEBRIETY

AT a meeting of this society on July 11 a discussion on

Alcohol and Drug-addiction in Relation to Crime

was opened by Dr NORWOOD EAST, who said that Great Britain had the lowest crime-rate of any great European community and a much lower one than the United States of America, especially as regards violence. In 1937, of 805,336 persons convicted 52,425 (just under 6½ per cent) were guilty of drunkenness, as against an annual average of 193,354 in 1910–14 The number had declined continuously from 1920 to 1932 but had increased each subsequent year In 1937 the number of known drug-addicts was 620, but only 31 persons were dealt with for offences under the Dangerous Drugs Acts, 1920–32, and Regulations thereunder. Apart from drug-addiction, crime might be associated with drug-addiction if a criminal became a drug-addict or if an addict committed a crime, but this was unusual In fact, in this country the relation of drug-addiction to crime was insignificant in comparison with alcoholism.

As regards the incidence of alcoholism in the parents of criminals, in 4000 youths at Wormwood Scrubs prison in 1930–37 a family history of alcoholism was found in 52 per thousand, being more frequent in association with offences against the person, discipline, and property and with multiple convictions; the incidence of a family history of drug-addiction was insignificant (2¼ per thousand) Dr East had investigated the incidence of alcoholism among 100 men and youths tried for murder in post-war years (90 of them in the last ten years) and had found alcohol as a predominant or a contributory cause in 19. He had also examined between April, 1907, and December, 1910, 1000 cases of men and youths charged with attempted suicide and had found alcohol as an important cause in 39 3 per cent He did not know of any statistics showing the relation of alcohol to sexual crimes in this country, but in 1924 he had found only 9 alcoholics among 150 men charged with exhibitionism Criminals sometimes took to alcohol to nullify their inhibitions, and the association of alcoholism with prostitution was sometimes due to the same purpose Every practical criminologist would attach some importance to the association of alcoholism with crime, but it was very easy to over-emphasise the connexion

Insanity might lead to drunkenness, and vice versa. The typical crime committed in mania a potu was one of violence, and the terrifying hallucinations of delirium tremens might be responsible for murder, suicide, violent assaults, or damage to property In the more chronic forms of insanity, theft, fraud, and sexual offences were not uncommon; crimes of violence might be due to hallucinations or to delusions, and crimes of violence, sexual offences, thefts, embezzlement, or vagrancy might be caused by mental deterioration brought on by chronic alcoholism. Criminal conduct was obviously favoured by the abnormal mental condition due to drunkenness apart from insanity. The impairment of reason, the lack of appreciation of the consequences, the emotional disturbance, the divorce from reality, the loss of inhibition, and the consequent unleashing of personal predilections were responsible for many crimes committed by alcoholics

There was a tendency in some alcoholics for subsequent crimes to be of the same pattern as a previous crime, thus resembling some cases of crime due to epilepsy This resemblance might be accentuated if there were no subsequent recollection of the criminal conduct; and, if an epileptic had taken alcohol before committing a crime, the diagnosis between alcoholic and epileptic automatism might be impossible. It was also important to remember that after certain illnesses, such as head injury, brain disease, or a previous attack of mental disease (especially delirium tremens), the offender might be more susceptible to alcohol than formerly—the so-called pathological drunkenness

In considering the legal aspect Dr East said that formerly drunkenness was not accepted as an excuse for crime, because the defendant did wrong in getting drunk, and an offender under the influence of drink could derive no privilege from a madness voluntarily contracted Later it was ruled that, on an indictment for murder, intoxication of the accused might be taken into consideration to show that the act was not premeditated In 1920 the House of Lords decided that insanity, whether produced by drunkenness or otherwise, was a defence to the crime charged

The treatment of the alcoholic and the drug-addict guilty of a major crime was not difficult, for the sentence imposed was usually long enough for the efficient withdrawal of the drink or drug as well as for general and special medical treatment It was more difficult in petty crime associated with alcoholism

or drug addiction because of the shortness of the sentence Compulsory detention of inebriates in the past had been found ineffective in the more advanced cases Medical treatment might be more successful if tribunals had authority to enforce compulsory detention on criminal alcoholics and drug addicts for considerable periods early in their careers Clause 34 of the Criminal Justice Bill now before Parliament proposed to enable courts of assize and quarter sessions to pass two new types of sentence corrective training for not less than two and not more than four years on offenders between 21 and 30 whose records, character, and habits made such a sentence expedient for the training of the offender, and preventive detention for a similar period on persons over 30 whose criminal antecedents and mode of life made such a sentence expedient for the protection of the public Under these provisions some of the more criminal alcoholics would be detained with benefit to themselves and the public Clause 38 enables a medical report on the mental condition to be obtained without remanding the accused, thus inebriety and drug addiction as the underlying cause of the crime might be diagnosed earlier Clause 19 enables offenders with some form of mental illness or abnormality, though not certifiable, to undergo medical treatment as either resident or non resident patients

Too much reliance should not be placed on psychotherapy Evidence was given before the Persistent Offenders Committee in 1931 that psychotherapy had proved successful in only 2 or 3 cases of inebriety out of 60, and in only 1 case out of 11 morphia addicts In an investigation of the psychotherapy of crime at Wormwood Scrubs in 1934–38 no case of alcoholism had been treated by this method, and 4 carefully selected cases of drug addiction gave disappointing results In the report based on this investigation Dr East and Dr W B de B Hubert had recommended the establishment of a special penal institution where psychiatric treatment could be given more effectively than in an ordinary prison to mentally abnormal but not defective or insane prisoners Further investigation, however was necessary before treatment of confirmed alcoholics or drug addicts could be undertaken with confidence

Some women were repeatedly sentenced to short terms of imprisonment for drunkenness and made up the "stage army" of inebriates in the women's prisons Dr J C McI Matheson, governor of Holloway prison, had said that of 2222 women received into that prison in 1936 for various offences 1112 had been convicted of drunkenness, the youngest being 22, 5 per cent under 30, 55 per cent 31–50, and 40 per cent over 50 Dr Hast had been much impressed, when an inspector under the *Inebriates* Act, 1898, by the fact that a considerable proportion of women in the institutions remained in residence indefinitely, although they had not been received under the act and were at liberty to leave They found in the institutions the shelter companionship, sympathy, interest, and freedom from anxiety denied to them in the outer world According to Sir Samuel Hoare the number of habitually inebriate women was steadily and quickly decreasing

In conclusion Dr Hast said that, though the alcoholic, the drug addict, and the criminal were abnormal, the clue to much that arose from their abnormal, the clue to much that arose from their association would be found in the study of normal behaviour Medicine could contribute much to the solution of the problems raised by them, but future social progress and administrative action must be relied on for large scale results

ASSOCIATION OF CLINICAL PATHOLOGISTS

Clinical Pathology of Tuberculosis

At a meeting of this association held in the Coventry Joint Laboratory on July 1, with Dr A F Wright in the chair, a paper on

TESTING MILK FOR TUBERCLE BACILLI

was read by Dr S Roodhouse Gloyne (London) He said that there are three possible methods of carrying out the test—namely, direct film examinations of the centrifuged deposit, cultivation on non glycerinated egg medium, and guineapig inoculation In his experience direct film examination only yields about a tenth of the number of positives that animal inoculation does Cultural methods, though valuable for other fluids and for sputum, are of little use in milk testing, owing to the prevalence of saprophytic aerobic spore bearing organisms The guineapig test not only gives the highest percentage of positives but it is also the only test which can be used as absolute proof in a court of law The drawback of the test is, of course, the length of time taken to obtain the answer He recommends that 100 c.cm of milk should be centrifuged for half an hour at 3000 revolutions per min, and that the centrifuged deposit should be treated for the same length of time with normal soda to destroy secondary organisms and then neutralised with normal hydrochloric acid before inoculation The animal should be killed not less than five weeks afterwards and no case must be reported as positive without definite naked eye signs of tuberculosis (including infection of the regional lymph glands) and the finding of acid fast bacilli microscopically Dr Gloyne's earlier figures—1500 tests for the years 1928–31—showed 9·1 per cent of positives, whilst his latest figures—3960 for the years 1935–39—show only 6·2 per cent Although the two series are for various reasons not strictly comparable it looks as though some improvement in our milk supply is at last taking place A series of 276 pasteurised samples, however, yielded 2·5 per cent of positives, which seems to indicate that not all pasteurisation plants are efficient

COMPARISON OF CULTURE AND ANIMAL TESTS

Dr E N Daley (Gloucester) pointed out that it is in respect of the bacillus most associated with his name that the postulates of Koch are most commonly broken in that as a rule no attempt is made to isolate tubercle bacilli from suspected cases by culture This is because of the difficulty experienced in culturing the organism, but this difficulty has to a great extent been overcome by the introduction of the media of Lowenstein, Petragnani and others Dr Daley's present series of results are based on cultures on Lowenstein medium, but he believes that Petragnani's medium gives greater speed and richness of growth After describing his preparation of the medium and his method of preparing the inoculum by digesting it with 4 per cent sodium hydroxide followed by repeated washings with saline or sterile distilled water, he detailed his results in a series of 112 specimens of sputa, pleural exudates urines, pus and cerebrospinal fluid He had 18 per cent positive on films, 32 per cent on cultures and 29 per cent in animals, when the identical material was used in each instance In another series of 150 cases he had 18·5 per cent positive in films and 37 per cent positive on cultures These specimens were selected

ones from cases where the clinical findings and the direct film findings disagreed In cultures the vast majority showed an excellent growth in three weeks, as compared with five to eight weeks by the animal method In another small series of sputa specially selected as negative on film examination, he found 3 out of 12 were positive on cultural examination. Dr Davey concludes that although the animal will still be the ultimate test of pathogenicity, the cultural method recommends itself as being equally accurate (no positive film failed to produce a growth), quicker and cheaper; it does away with the expense and anxieties of an animal house and the need for procuring a licence for vivisection It is an adequate substitute for the animal test in disclosing tubercle infections in "T.B minus" cases, and would also be a good guide in determining when it is safe to release a patient from isolation in a sanatorium

DIFFERENTIATING SAPROPHYTIC ACID-FAST BACTERIA

Dr H SCHWABACHER (London) recalled the wide distribution of saprophytic acid-fast bacilli in dust and water, and the impossibility of differentiating these organisms from tubercle bacilli purely on microscopical evidence She enumerated the precautions it is necessary to take to avoid the occurrence of saprophytes in films prepared for direct examination.

(a) All containers for pathological material should be cleaned with weak soda solution or bichromate mixture, and rinsed out with hot water and finally with glass-distilled water before being sterilised in the autoclave or hot-air oven

(b) The solutions for the Ziehl-Neelsen stain should be prepared with glass-distilled water. Common baths for staining and decolourising are to be strongly deprecated, for floating organisms are caught on negative slides.

(c) If the slide is not a new one, it should be passed through a bunsen flame 24 times, each to-and-fro passage occupying about one second Only complete charring will remove bacilli once they have been thoroughly fixed on glass

(d) The oil-immersion objective should be wiped in case any acid-fast bacilli have become attached to it from the previous film The oil from the bottle should be allowed to fall on the film, care being taken that the rod does not come in contact with the stained preparation, since otherwise acid-fast organisms may be transferred back to the reservoir

(e) If it is required to rub up material on a slide, a drop of water from a cold water tap should not be used since saprophytes grow abundantly on the mouths of all cold water taps.

The primary colony of tubercle bacilli or acid-fast bacilli usually takes three weeks to become visible on egg medium This primary colony should be sub-cultured on to two tubes of egg medium, the one tube to be used for typing purposes, the other tube, together with a subculture on agar medium, to be cultured at room temperature. If growth occurs at 22° C. the strain is a saprophyte. Tubercle bacilli do not grow at room temperature or on agar medium.

For animal inoculation it is usual to inject 1 mg. suspension of a seven- to fourteen-day-old culture intramuscularly into the left thigh of a guinea-pig and a rabbit. The animals are examined after six weeks and four months respectively. A bovine strain produces progressive disseminated tuberculosis in both animals. A human strain produces progressive tuberculous disease in the guinea-pig, while in the rabbit it only produces a local lesion at the site of inoculation and isolated tubercles in the lungs—i.e., non-progressive lesions A saprophytic acid-fast strain will fail to produce lesions other than a local abscess, however heavy the inoculum

EXCRETION OF TUBERCLE BACILLI IN URINE

Dr. C E DUKES (London) defined urinary tuberculosis as a clinical condition characterised by tuberculous lesions in the urinary tract, by the presence of urinary symptoms, and by the excretion of pus and tubercle bacilli in the urine Tuberculous bacilluria he described as an occult or subclinical tuberculous infection associated with the excretion of tubercle bacilli in the urine but not accompanied by urinary symptoms. These two conditions are both associated with the presence of tubercle bacilli in the urine, but the laboratory findings differ considerably In tuberculous bacilluria only a few tubercle bacilli are found and it is rare for them to be discovered in stained films of the centrifuged deposit. Guinea-pig inoculation is nearly always necessary for the demonstration of tuberculous bacilluria. The excretion of tubercle bacilli is intermittent in bacilluria, so that a test may be positive on one occasion and negative on another The urine looks clear and does not as a rule contain pus or blood, but at the time when the tubercle bacilli are being excreted microscopic examination will reveal an excess of leucocytes in the urine In cases of tuberculous bacilluria the excretion of tubercle bacilli may cease when the patient's general health improves.

In urinary tuberculosis on the other hand the urine usually contains large numbers of tubercle bacilli and they can generally be found in stained films of the centrifuged deposit. Cultures and guinea-pig tests are rarely necessary Dr. Dukes described experiments he has carried out which prove that the excretion of tubercle bacilli is generally constant in urinary tuberculosis. In cases where the bacteria are relatively scarce it is important to examine a concentrated specimen of urine of high specific gravity and containing pus. An early morning specimen of urine is usually best for this purpose. Urinary tuberculosis is almost invariably accompanied by pyuria, and often blood-cells are also present. The excretion of tubercle bacilli continues freely as long as an open tuberculous lesion can discharge into the urinary tract Dr. Dukes illustrated this by photographs of several dissected kidneys showing tuberculous lesions at different stages of development.

GROWTH-RETARDING POWER OF BLOOD-SERUM

Dr. W. PAGEL (Cambridge) said that he has found no growth-retarding power towards the tubercle bacillus in the blood-serum of approximately 90 per cent. of normal persons and those with the "adult type" of pulmonary tuberculosis—i.e., broncho genic phthisis restricted to the lungs. On the other hand, he has observed definite retardation of bacillary growth in about 75 per cent. of cases of "chronic disseminated tuberculosis"—i.e, chronic extrapulmonary tuberculosis, such as lesions of the urogenital organs, bones, joints and meninges He has demonstrated this by a method known as "depth cultures" of tubercle bacilli—namely, mixtures of serum with an asparagin-mineral salt solution and a suspension of tubercle bacilli incubated for 10-30 days He has tested 236 sera in this way. Growth-retardation occurs generally irrespective of the activity of the lesion, although it is more pronounced in active disease, and it is independent of the individual or species resistance to tuberculosis. The serum factor responsible for the retardation of bacillary growth withstands heating for half an hour at 56° C It can be absorbed by a wide range of acid-fast organisms and *Bact coli*, but not by staphylococci and diphtheria bacilli. Absorption is not

stimulated by the introduction of growth promoting factors such as lytic products liberated from the organism used for absorption, nor is it due to an alteration of serum complement It is not unlikely that "natural antibodies" (perhaps similar to the β lysins) are responsible for the phenomenon, because after absorption the bacillary growth is also increased in serum from normal individuals and also because specific vaccination does not confer growth retarding power on the serum

RELATION OF TUBERCULOSIS TO SILICOSIS

Dr A F S SLADDEN (Swansea) gave a statistical summary of pathological examinations of post-mortem lungs from industrial workers supposed to have suffered from silicosis His analysis dealt mainly with a large group of colliery workers, and, for comparison, with a group of other workers subject to silica hazard, but not to coaldust He pointed out that in the first group silicosis was commonly found without any demonstrable tuberculosis, and showed that the relative incidence of tuberculous disease in the second group was double that in the first He referred to other reasons for thinking that a protective factor against tuberculosis exists in coaldust, and put forward the greater frequency of silicosis without superimposed tuberculosis amongst coalminers as an argument in support of this "protective factor"

REVIEWS AND NOTICES OF BOOKS

The Building of a Nation's Health

By Sir GEORGE NEWMAN, G B E , K C.B , M D Edin , F R C P , formerly chief medical officer, Board of Education (1907–35) and the Ministry of Health (1919–35) London Macmillan and Co 1939 Pp 479 21*s*

NOBODY who has the privilege of Sir George Newman's acquaintance will doubt that for him official retirement does not mean an end of intellectual effort Should the storm burst he will play his part, if the clouds pass he, like Allbutt and Osler, will employ his leisure in the service of literature In speaking of his book as a valedictory we certainly do not mean that his public services are concluded But there is a sense in which this book, a history of events in which the author had a large share, may properly be termed a valedictory address and compared with the utterances of predecessors who had served the state in the same field of endeavour Of the three great men whom Newman often names—Chadwick, Farr and Simon—one only composed a valedictory on this scale, and all three retired from the public service with a *sense of grievance* Farr, like Morant, gave his life to the state Chadwick and Simon long survived official retirement but their wrongs sometimes coloured their judgments of men and measures It would be fantastic to suppose that in an official life of nearly thirty years Newman has had no disappointments, never been wounded *and never* wounded others But this book reveals no half healed scars and contains no harsh judgments of individuals

It is, of course, with Simon's books that this book challenges comparison Both writers had a literary *gift* In their official utterances Simon had greater dramatic force, Newman more urbanity Simon was more fitted to startle and terrify, Newman to persuade and please Simon's literary danger was melodramatic violence, Newman's a too easy optimism In this volume Newman's literary merits are conspicuous and the defects of his qualities unobtrusive one can easily understand how far more successful he has been than his great predecessors in interesting the general reader It is of course true that Newman has had a more receptive public than Simon and a sure instinct leads him to emphasise from beginning to end of the book the paramount importance of education, general and technical

Some readers may think that in a comparatively short book too many pages are devoted to the history of education They will be in error Not only a properly educated medical profession but a properly educated electorate are necessary and almost sufficient conditions for sanitary reform In speaking of the decline of infant mortality Newman puts the greatest stress not upon specific sanitary reforms but upon the education of the mothers "Several million mothers became 'child conscious' It was this almost universal *maternal awakening* which really began to change the outlook of child health—as every alert medical officer of health knew in his own district between 1904 and 1910" It is said that Simon de Montfort, watching from Evesham tower the advancing troops and noting their soldierly bearing and formation, said "I taught them that" The youngest and therefore harshest critics of the "optimism" of the Ministry of Health and of the Board of Education in recent years might have railed against but could not have criticised the Ministry without some technical knowledge Newman, directly in his reports and indirectly through the lay journalists who read his reports (a compliment never paid to the writings of Farr and not often paid to those of Simon), has been a great educator

In successive chapters Newman reviews the organisation and training of the medical profession, the development of the Ministry of Health, the awakening of the local authorities These are concerned with matters of general principle and have a logical connexion The next three chapters treat in detail of the problems of school life Then the mother and her infant, the nutrition of the people, the welfare of the industrial worker, health insurance and medical research are studied. The last chapter is a biographical sketch of Robert Morant It may be true that the order of the later chapters of the book is not logical but one has the advantage that each chapter is complete in itself A layman could read almost every word of the book with pleasure and profit and there are very few medical men whose knowledge will not be enlarged by its perusal. As we have already hinted, its literary style is mellower than that of the reports and fully justifies Newman's decision to write a new book and not reprint his papers

No doubt many too young to have personal knowledge of sanitary conditions fifty years ago and even some older people exasperated by the bad side (always so much easier to recognise than the good side) of civil service mentality, will chafe at the easy, urbane flow of the narrative, will find it reminiscent of the eighteenth century It is not that there are no shadows in the picture—Newman has not failed to mention present defects and evils—but undoubtedly the landscape is sunny In this time of A R P distressed areas and general gloom has anyone the right to be bland and optimistic? That is the question one illogically asks oneself But it is quite

irrelevant Newman was not writing a history of modern society but of public-health administration and its relation to the bodily health of our people The story is one of progress Nobody old enough to have had medical experience of (say) East London in the last decade of the nineteenth century will have any doubt on the matter Newman not only had the right, it was his duty to dwell upon the good side of our recent history

In this exhibitionist era valedictories are legion and there is always a welcome for "revelations." It would have been very easy for Sir George Newman to follow many precedents and cast himself for the rôle of the Wise Man hampered by politicians and lay administrators He has chosen a better part and written a book worthy to stand on the shelf next to "English Sanitary Institutions" and sure to be much more frequently consulted

Thorpe's Dictionary of Applied Chemistry

(4th ed.) Vol. II (Bl— Chemical Analysis). By JOCELYN FIELD THORPE, C B E., D.Sc., F.R S., F.I.C., professor of organic chemistry and director of organic laboratories, Imperial College of Science and Technology, London; and M. A. WHITELEY, O B E., D Sc, F.I.C, lately assistant professor of organic chemistry at the college. London: Longmans Green and Co. 1938. Pp. 711. 63s.

THE second volume of this large and valuable work shows little change in policy from that pursued in the first. A large number of experts, representing many branches of science, have contributed a remarkable variety of articles to this volume. Many of them are of special value and interest to workers in the medical sciences, such as those on blood, carbohydrates, cardiac glycosides, carcinogenic hydrocarbons, carotene and carotenoids. We confess to have got most entertainment from the fascinating and informative sections on blacking, brandy, bread, brewing and butter. No less than 170 pages are devoted to a small treatise on chemical analysis which cannot be said quite to fall between two stools, since it describes briefly the methods it recommends, and mostly gives at the same time the appropriate references to original sources This section is well up to date, including most of the new techniques which the analyst has applied to his work in recent times Much of the space in this volume is assigned to pharmaceutical subjects. For a work of reference this makes unusually good reading, it is attractive both in appearance and in substance

Tropical Medicine

(3rd ed.) By Sir LEONARD ROGERS, K C S.I., F.R.C P., F.R S., late medical adviser to the India Office; and Sir JOHN W. D. MEGAW, K.C.I.E., M.B., medical adviser to the India Office. London: J. and A. Churchill. 1939. Pp. 544. 16s

THE authors of this book have both had great experience in the tropics and can therefore tell the student and the medical man what he really needs to know They classify diseases in accordance with their causal agencies, occasionally changing their plan when a clinical classification would be more helpful Thus there are sections on the febrile diseases due to protozoa, spirochætes, viruses, rickettsia bodies, bacteria and helminths, and another grouping the diarrhœal diseases together Snake poisons, dietetic diseases, diseases associated with physical agents, and the incidence of general disease in the tropics all receive notice. The use of the microscope in routine tropical practice, often omitted from clinical textbooks, is here dealt with thoroughly, and rightly so, since the man who tries to practise in the tropics without this instrument is literally and metaphorically working blindly. The revision and proof-reading seem to have been somewhat hurried, for there are a number of minor errors. The book, which is well illustrated with diagrams, photographs and maps, winds up with some general remarks on the diagnosis of fevers and the recording of cases

Klinische Chemie und Mikroskopie

By Dr. LOTHAR HALLMANN, director of the bio chemical and bacteriological department of the Stadtisches Kaiser-Friedrich- und Kaiserin-Friedrich-Kinderkrankenhaus, Berlin Leipzig: Georg Thieme. 1939. Pp. 387. R.M.12.

THIS book deals with clinical chemistry and microscopy in a full and detailed manner, but on blood-analysis it is a little out of date, since many of the techniques described have now been superseded by more recent American methods The book, however, is not likely to appeal much to English readers who are already well supplied with literature in their own language on these subjects

Classic Descriptions of Disease

(2nd ed.) By RALPH H. MAJOR, M.D., professor of medicine, University of Kansas school of medicine. Springfield, Illinois: Charles C. Thomas 1939. Pp 727. 27s.

Prof Major compiled his anthology partly because he is interested in the "actual words" of our predecessors, and partly to enable teachers to bring to the notice of students the first records of much that is now routine knowledge. Those who have the leisure and the taste for gleanings from the past will appreciate the contents but will regret some omissions. Thus Prof Major gives us Thucydides's brilliant account of the plague at Athens, but does not set beside it the equally fine passage in the sixth book of Lucretius on the same theme He gives us Kircher on *contagion*, but not Henle on miasmata and *contagion* But it is churlish at so ample a feast to complain of the absence of particular dainties The good things set before us include Corrigan on Corrigan's pulse; Graves and Basedow on the disease to which either of their names may be attached; Heberden on angina pectoris and on nodes; Nicholas Tulp on diphtheria and on beriberi; and passages from the works of Morgagni, Vieussens, Laennec, Corvisart, Auenbrugger, Schonlein, Caius, Sydenham, among scores of others of greater or lesser note The biographies preceding the excerpts are terse, accurate and scholarly, and sometimes amusing. The brief notice of Nicholas Tulp notes his success in psychotherapy: "he is said to have cured Rembrandt by suggestion of a mental disease which caused the famous painter to believe that his bones were turning into jelly." The paper on Devonshire colic will remind readers of the careful experiments and masterly reasoning by which Sir George Baker discovered that lead poisoning was the cause of this condition. The volume contains much that will be treasured by those interested in medical history. It is perhaps a small thing to set against its merits that though this is a second edition there are many misprints, misspellings and minor errors of printing and punctuation

THE LANCET

LONDON SATURDAY, JULY 15, 1939

THE WATERED MILK BILL

THE Milk Industry Bill presented to the House of Commons in November, 1938, embodied a long-term policy for the production and distribution of milk based on a well known white-paper. This bill was withdrawn in February and the new bill, which was read a second time on Friday of last week, was unfeelingly but aptly compared by a Labour member to the feat of a noble duke who marched his men up a hill and then marched them down again The new bill has avoided controversy by omitting all its important provisions It no longer provides for a milk commission to keep the industry under review and to tender advice when needed, and with this omission disappears also the power to spend money on research and education, gone is the regulation of imported milk and milk products, gone is the power to make pasteurisation orders and to prevent the sale of unpasteurised milk, gone are the schemes to reduce the cost of distribution The first and last of these omitted provisions might have done much to reduce the present high cost of milk to consumers, the third was an overdue step towards making milk safe to be consumed All that is left (excluding minor matters) is extra payment for what is called quality milk, the authorisation of cheap milk for the school population and the extension of the provision for mothers and young children, and the Exchequer grant for milk used in manufacturing butter and cheese

The proposed concessions are in all essentials similar to those in the first bill The payments for quality milk, of which a material part is to be borne by the Exchequer, are still subject to the criticism that "accredited milk," with a bonus of 1½*d* per gallon (½*d* from the Exchequer), is neither safe from conveying tubercle bacilli nor from being a vehicle of other pathogenic organisms It is difficult to see the wisdom of a state contribution towards the production of a quality of milk which, although admittedly cleaner, is little safer than ordinary milk from the risk of conveying disease These proposals are however to operate only from Oct 1, 1938—i e, retrospectively—to Sept 30, 1940 The cheap milk schemes have the same interim character They were welcomed by the medical profession when first introduced and will be again acclaimed, but with the same reservation as regards safety The new bill leaves entirely unsatisfied the unanimous claim of the leaders of the medical profession, which is also the policy of the Ministry of Health, that the milk supply of great Britain should be made safer The milk industry cannot flourish so long as this expert opinion is flouted The only gram of satisfaction is that the present bill is a temporary measure and only postpones for a short spell the realisation of a long-term control of the industry designed both to lower the price of milk and to limit its capacity to convey disease

THE STOMACH IN PERNICIOUS ANÆMIA

Two historical observations In 1870 FENWICK [1] demonstrated structural atrophy and impairment of function in the gastric mucous membranes of patients dying of pernicious anæmia In 1929 CASTLE [2] demonstrated, in patients with pernicious anæmia, the lack of a hæmopoietic substance ("intrinsic factor") normally present in gastric juice Reasonable deduction Fenwick's atrophy is responsible for the deficiency of Castle's factor But that simple putting of two and two together to make four has proved unexpectedly difficult For MEULENGRACHT [3] has shown that in the pig the anti-anæmic factor is to be obtained from the pyloric end of the stomach and the duodenum, but not from the body of the organ, while both he,[4] and MAGNUS and UNGLEY,[5] have recently made it quite clear that the histological abnormalities in the pernicious-anæmia stomach—call them gastritis or atrophy, or both—are conspicuous in the body of the stomach and virtually absent in the pyloric glands and the related duodenal glands of Brunner It is not obvious how structural change in the body of the stomach can explain functional disturbance in normal-looking antrum and duodenum It may be that the pig differs from man, and that the intrinsic factor arises in the former in the pyloric region, in the latter in the body The anatomical similarity between the two species, however, makes this unlikely, and MEULENGRACHT prefers to suggest other reconciliatory hypotheses that the pyloric and Brunner glands, like the islets of Langerhans, can fail in function while structurally intact, that they require activation by a hormonal product of the mucosa of the body of the stomach, much as the pancreas requires secretin, or even that the main disturbance in ordinary pernicious anæmia is more a failure of intestinal absorption of the anti-anæmic product than a failure of production of one of its factors

Hitherto the gastric atrophy has usually been looked on as extensive and irreversible This has perhaps been too readily inferred from the well-established fact that the gastric mucosa in treated cases practically never recovers the power of secreting acid The proof of the matter lies with the pathologists, but their opportunities of examining well fixed stomachs of pernicious anæmia patients dying in remission have not yet been numerous Meanwhile the gastroscopists have entered the field, and the claim of JONES, BENEDICT and HAMPTON [6] to have demonstrated regeneration

1 Fenwick, S *Lancet* 1870, 2, 78
2 Castle, W B, *Amer J med Sci* 1929, 178, 748
3 Meulengracht, E *Acta med scand* 1934, 82, 3
4 Meulengracht *Amer J med Sci* 1939, 197, 481
5 Magnus, H A and Ungley, C C, *Lancet*, 1939, 1, 470
6 Jones, C M, Benedict, E B and Hampton, A O, *Amer J med Sci* 1939, 196, 594

of atrophic gastric mucosa in treated patients has been followed by a more extensive study from SCHINDLER, who is one of the parents of the modern gastroscope. It concerns 23 patients with well-attested pernicious anæmia. In most of those who were untreated SCHINDLER and SERBY [7] saw the well-known and easily recognised atrophic features—thinness and greying of the mucosa and visible fine red branching vessels In some the atrophy was extensive, in others only patchy and discrete; it usually affected the body of the stomach, but in one case was most marked in the antrum, and in another case SCHINDLER satisfied himself that no atrophy, only a superficial gastritis, was present. Many of the patients were re-examined after some months of liver treatment, when their blood-pictures had returned to normal. Four of them showed little change; in one the atrophy had advanced, in four or five the gastric mucosa presented a normal appearance If this be accepted it will reconcile the discrepancy between the claim of JONES, BENEDICT and HAMPTON, and the failure of HARTFALL [8] to find any convincing gastroscopic evidence of regeneration during remission under treatment. Both seem to be right, and the stomach may sometimes (but not always) behave like the smooth glossy tongue, which recovers its pile when liver is given. But this does not simplify the pathogenesis of pernicious anæmia It forces SCHINDLER and SERBY to the assumption that in this condition two separate disorders of the stomach are present: first a dysfunction of the cells producing Castle's intrinsic factor, and secondly a degenerative and inflammatory change in the gastric mucosa which, sometimes at least, recovers under liver treatment and therefore may be attributable to a deficiency state. To these may be added a third disturbance, the achlorhydria, which accompanies the first. SCHINDLER and SERBY do not consider the alternative possibility that the atrophy of both tongue and stomach may be due to the prolonged anæmia itself, for both may be found in the common hypochromic anæmia due to iron deficiency; the gastric atrophy—as judged by the gastroscope—might be reversible in the less advanced and irreversible in the more advanced cases. That view has at least the merit of simplicity, and should be refuted before a new specific deficiency is invoked

THE HOLIDAY

THE decision how we shall spend our holidays often represents a compromise in which our individual choice may have played only a minor part. Custom, the claims of children, international tension, familiar problems of time and money—there are many constraining influences upon personal wishes. But it is doubtful what our personal wishes and wants are. Many of us, about to go on holiday and having nothing to consider but our more selfish desires, can hardly be sure what it is that we want of the holiday. Is it to be idleness or activity, or perhaps an alternation of each? Shall our activity be as different in kind as it can be from our daily work? If we are people who work with our heads all the year round, shall we now pile up the lactic acid and the stiffness by physical exertion and let the cortex rust? Shall we ride a hobby or a horse, cultivate our æsthetic leanings or our gardens? Not all who make their choice in these matters are confident beforehand, or afterwards, that this is the ideal holiday they have chosen "Change of scene" is an old prescription and "rest" is an older one—as old as the sabbath. But change of scene is nowadays interpreted as a psychological, not a geographical and climatic affair, and rest is a qualified notion, implying rest (i.e. change) from one's usual activities rather than the utter rest of quasi-stupor.

It might be expected that the psychologists and psychiatrists would have something to say about all this; the psychology of industry has had much occasion to study the need of rest and the forms rest should take, and the psychiatrist is continually dealing with jaded people. Ordering people away for the sake of their nerves has been a well-known function of the physician. But it is decidedly unusual in our days for the psychiatrist to advise a sea-voyage—or travel of any kind—as a remedy for the surfeit and weariness of neurotic depression. He may, it is true, occasionally think that the sympathetic stimulation of mal-de-mer will have the salutary effects attributed to it in the treatment of schizophrenia by sages of the past (and the present), but in general it is not change of scene as an end in itself that is of value in his eyes but rather change of milieu (such as might even be attained while one stayed at home) whereby one escapes from emotional bonds and complexities, from harmful associations, reminders, habits. The psychiatrist is not concerned to get the patient away from himself but rather to create the conditions in which he may return to himself, give freedom and expression to inhibited or thwarted inclinations the standpoint is more that of Rousseau than of the Scarlet Pimpernel. When the psychiatrist advises his patient to enter a nursing-home or clinic it is not for Weir Mitchell treatment—that negation of activity, that winter holiday of the dormouse—but for a regimen in which every hour is planned and occupation more conspicuous than recreation Often the psychiatrist sees that it is the very breadth of choice open to the irresolute patient that has been beguiling and bothering him; his days must be arranged for him, occupation imposed upon him, sometimes with no more cooperation on his part than he gives to his dietary or medicinal regime Sometimes the occupation proposed will be close to the patient's work in ordinary life, so that he is not called on for the effort of acquiring a new skill, sometimes it will be remote and will demand effort and patience both from him and his teacher-therapist. The psychiatrist has not yet worked out the principles on which his occupational therapy rests and by conscious application of which he can prescribe it; it is useless to appeal

[7] Schindler, R., and Serby, A. M., *Arch. intern. Med.* 1939, 63, 331

[8] Hartfall, S. J., *Proc. R. Soc. Med.* 1939, 32, 527

to him to tell us how far they are applicable to the holidays, salutary or therapeutic or prophylactic in intention, which healthy people take The same is true of "recreational therapy," now increasingly employed in the treatment of the mentally ill, but still without precision At all events such things as private worries and desires, occupational and social troubles, temperament, opportunity and training make any simple or general rule impossible, whether it be for the treatment of the sick by clinic holidays or for the healthy man walking into Cook's to book his berth

The physical advantages of a holiday are obvious but do not always run parallel with the psychological ones In the latter it is freedom from insistent anxieties and restraints that works most efficiently Contentment in what one is doing on the holiday, whether it be yachting or learning Chinese, release from irksome conventions and ties, freedom to follow one's bent (towards dirt or dilatoriness, floating or diving)—these will be more potent than change of air Indeed, if vocational guidance, mental hygiene and our social system had all attained perfection, we should find in our daily working lives, as a few lucky dogs do, such satisfaction and freedom that holidays would be superfluous There will be no holidays in heaven

ANNOTATIONS

THE PROCESS OF AGEING

WITH the steady increase in the average age of the population the physiology of age becomes more and more important, yet its study is still largely neglected The healthy young adult can no longer claim to be typical of the human race, but must give place to the man of 35 The great problem in nearly every aspect of ageing is to differentiate pathological processes from those due to time alone, the longer an organ or tissue lives, the more likely is it to suffer from trauma or infection A remarkable study [1] of the biological and medical aspects of ageing made by Professor Cowdry of Washington University, St Louis, and others, deals not only with every part of the body but with the mind as well The early chapters on plants protozoa and insects show how fundamental are the problems to be tackled In some of the chapters "ageing" is interpreted as meaning any change taking place with time, the twenty six authors having insufficient material on which to base conclusions about advanced age Occasionally indeed the object of the book seems to have been forgotten for a paragraph or two, but this is in keeping with one of the two strong impressions gained by the reader The first of these is that here we have an anatomical physiological study of the body by a number of persons of many and diverse interests, and, quite apart from the object of the work, the result is an extraordinarily interesting collection of facts presented in quite a new way It would be difficult, for instance, to find in any ordinary textbook such an informative chapter as that on lymphatic tissue, yet the facts given are not of such a type as one would expect to have to search for in special places The book might with advantage be combed by teachers of anatomy and physiology for points which they have overlooked or about which they thought nothing was known The second impression is one of surprise that so much research has been done on the question of age from one aspect and another, and that so much knowledge has already accumulated—much of it of direct interest to the doctor who too often feels that in the treatment of elderly patients he has to lean too heavily on his personal experience and certain vague traditional ideas The book has been deliberately produced in order to foster scientific interest in the subject of normal ageing and one of its objects is to demonstrate the large gaps which still exist The study is timely from the scientific point of view in that a suitable moment has been chosen for a stocktaking of existing knowledge, and from the sociological point of view in that everyone is now "population conscious"

[1] Problems of Ageing Biological and Medical Aspects Edited by E V Cowdry, professor of cytology, Washington University St Louis London Baillière, Tindall and Cox 1939 Pp 758 42s

COLOSTRUM AND IMMUNITY

ALMOST every textbook of obstetrics and pædiatrics mentions vaguely that one of the functions of colostrum is to convey immunity to the newborn baby, but scientific evidence of this important fact, if indeed it is a fact, is scanty, and experimental work in the veterinary world is not necessarily applicable because anatomical differences in the formation of the placenta in different species introduce the difficulty of distinguishing between immunity transferred through the placenta and through the colostrum Schneider and Szathmary [1] have now studied the antibodies in the colostrum of cows and in the blood of newborn calves By inoculations they raised the immunity of pregnant cows to 170 diphtheria antitoxin units per c cm of blood and an antityphoid titre of 1 in 100 At this stage colostrum was withdrawn and found to contain 1400 units of antitoxin and an antityphoid titre of 1 in 5000 Roughly speaking then at this stage of pregnancy 1 c cm of colostrum is equivalent to 10–50 c cm of maternal blood serum as regards its antibody content Immediately after birth and before being allowed a feed calves from these immunised cows were found to have less than 0 02 unit of antitoxin per c cm of blood serum and no trace of typhoid agglutinins Within ninety minutes of the first feed of colostrum however, the antitoxin content of the calves' serum had risen to 0 25 unit per c cm and an agglutinin titre of 1 in 1 After twenty four hours of normal feeding the antibody content of the calves' blood was about 10 per cent of that of the maternal serum By this time ordinary milk was being secreted, which only contained negligible amounts of antibodies as compared with colostrum

These results confirm the eminently practical effects obtained in the prevention of lamb dysentery whereby the ewe is inoculated with a vaccine and immunity is conferred on the lamb provided that an early colostrum feed is allowed How far these results could be applied to human medicine cannot be estimated for lack of data Clearly the primitive nature of the bovine placenta prevents any transplacental interchange of serum proteins, whereas this

[1] Schneider I and Szathmary, J Z Immunitätsforsch 1938 94 454

is not true of the human placenta. The matter is capable of relatively easy determination, for example, by estimating the diphtheria antitoxin content of maternal serum, colostrum, and the serum of the newborn human baby The mechanism whereby the bovine lactating tissue mobilises, concentrates or synthesises antibodies for excretion in the colostrum also demands careful study Finally, the absorption of immunising substances from the gastro-intestinal tract in the calf and lamb opens up another field of experiment in the human subject, in whom it has become routine practice to give immunising agents parenterally The question "does colostrum really matter?' is one which pædiatricians would like answered.

THE FRONTAL LOBES

OPINION regarding the importance of the frontal lobes for the life of the mind has fluctuated during recent years The recognition that tumours involving the frontal lobes are apt to produce severe mental changes led to the belief that this part of the brain was concerned in some special way with mental function Later it was appreciated that such changes were probably in part remote effects of the tumour The increasingly radical measures of neurosurgery have provided the opportunity of observing the effects of unilateral and even of bilateral frontal lobectomy in man and of comparing the human reaction to such cerebral amputation with that of experimental animals Recent writers, notably Penfield and Jefferson, who have studied the results of unilateral frontal lobectomy have tended to stress the slightness of the consequent mental symptoms, and Jefferson has argued that the frontal lobe has no functions for the mental life that are qualitatively different from those of any other part of the brain.

Dr. Gösta Rylander[1] of Denmark has studied the effects of unilateral frontal lobectomy in 32 cases. His psychiatric outlook has enabled him not only to make an exceptionally thorough psychological investigation of his patients but also to assess the shortcomings of individual tests He lays stress on the importance of the patient's preoperation personality and carefully avoids dogmatism, pointing out that symptoms are often capable of more than one psychological interpretation. His investigation shows that skilled psychiatric examination reveals a fairly constant change both in the intellectual and emotional spheres in patients in whom one frontal lobe has been removed The emotional changes consist of a diminished inhibition of affective responses and a displacement of the habitual feeling level, in most cases towards euphoria In the volitional sphere restlessness and deterioration of initiative and interest are characteristic The intellectual changes involve mainly the higher faculties

TREATMENT OF SERUM SICKNESS

BOTH the incidence and severity of serum reactions have diminished sharply since the introduction of concentrated therapeutic sera The common type of reaction encountererd nowadays consists of a generalised urticarial rash with or without constitutional disturbance—an event which may prove extremely irritating to the patient but does not endanger life When the need for antitoxin is urgent, as in diphtheria, the possibility of reaction must not be allowed to interfere with specific treatment In non-lethal diseases, however, such as mild, or even moderate, scarlet fever there is a natural inclination to weigh the advantages of serum therapy against the chances of serum sickness—from the patient's point of view the cure may seem worse than the disease

None of the remedies so far advocated for the control of serum sickness have proved more effective than the subcutaneous injection of adrenaline chloride in combination, if necessary, with ephedrine by mouth Foshay and Hagebusch,[1] working on the hypothesis that the major phenomena of serum sickness are due to histamine or a histamine-like substance, have sought to control it by administering an inactivating ferment obtained from the intestinal mucous membrane (histaminase). This compound, in the form of enteric-coated tablets, was given to a preliminary series of 8 cases of serum sickness, but the results were rather inconclusive, presumably because of irregularities in absorption Accordingly a further 13 cases were treated with an injectable form of histaminase either alone or in combination with tablets by mouth These patients, suffering variously from the effects of horse serum (8 cases), antitetanus serum (4 cases) and scarlatinal antitoxin (1 case), were all relieved to a considerable extent, but in more than half of them the benefit was not apparent for at least eighteen hours—long enough to introduce the possibility of natural recovery In an attempt to determine the prophylactic value of histaminase 8 patients were treated on the day before and for a certain time after the administration of different types of antitoxic sera Only 2 patients developed serum reactions, and these were very mild, which suggests that histaminase did have some preventive effect, though to be at all conclusive a longer series would be necessary. Meanwhile reactions may become negligible through the wider use of more recent methods of serum concentration and refinement Bradshaw's[2] incidence of 1·2 per cent of reactions in a series of 793 injections of refined (predigested) scarlatinal antitoxin certainly encourages this hope

A PIONEER IN BIOCHEMISTRY

FIFTY years ago died one of the first scientists to draw attention to the chemistry of urine—George Owen Rees, scion of a Welsh family whose ability has won them several niches in the "Dictionary of National Biography" Thus, his great-grandfather was Owen Rees, a nonconformist minister; his grandfather was Josiah Rees, a Welsh presbyterian minister, an uncle, Owen Rees, migrated to London and became a partner in the publishing firm of Longmans; and another uncle, Thomas Rees, at first in trade as a bookseller, later became a unitarian minister and a voluminous writer on theological and historical subjects A third of these brothers, Josiah Rees, was a Levantine merchant and was appointed British consul at Smyrna; he married an Italian woman, by whom he was the father of George Owen, another son, and a daughter

George Owen Rees was born in 1813 and was apprenticed at Guy's Hospital in 1829 In 1836 he studied botany under Sir William Hooker, took his M D Glasg, and returned to start practice in London An account of his activities is given in *Guy's Hospital Reports* for January. His ability attracted the attention of Bright, Swayne Taylor, Roget

1 Personality Changes after Operations on the Frontal Lobes By Gösta Rylander London Humphrey Milford, Oxford University Press 1939 Pp 327 15s

1 Foshay, I and Hagebusch, O E, *J Amer med Ass.* June 10, 1939 p 2398
2 Bradshaw, D B, *Lancet*, July 1, 1939, p 6

(secretary of the Royal Society and author of the famous "Thesaurus"), and Brodie, on whose recommendation he was appointed medical officer of Pentonville. In 1836 he published "On the Analysis of the Blood and Urine in Health and Disease," one of the earliest works on biochemistry. In 1838 he demonstrated hyperglycæmia in diabetes, being the first to make a quantitative estimate of blood sugar. Results of his team work with Bright on Bright's disease were published in *Guy's Hospital Reports* in 1843, with an appendix by Rees on "Observations on the Blood with reference to its peculiar condition in morbus Brightii." He had previously helped Bright in his work on jaundice. For many years he assisted Swayne Taylor in his toxicological work, giving evidence in the Palmer and other celebrated trials. Rees gave the Goulstonian lectures in 1845, the first Lettsomian lecture at the Medical Society of London in 1850, the Croonian lectures in 1856, and the Harveian oration in 1869, in which he suggested that "nerve force" might be analysed with the help of chemistry (see *Lancet*, 1869, 2, 26).

George Owen Rees died of cerebral hæmorrhage on May 27, 1889. He never married, having devoted his life to science and to the support of his impoverished mother, brother, and sister.

THE ALMONER AT THE V.D. CLINIC

THE post of lady almoner to a clinic for venereal diseases is one that calls for exceptional gifts. The patients who attend such a department are in general far from being the moral outcasts and degenerates that the public, and only too many of the medical profession, believe them to be. Usually they are ordinary human beings in serious trouble who are abnormally resentful of prying interference but highly responsive to sympathetic understanding. The almoner's work, therefore, has many pitfalls and many discouragements, but also many compensations to one endowed with a proper understanding and trained in the right methods of approach. Miss Manchée writes[1] from considerable experience at St Mary's Hospital, and her book is full of useful information for those who would tread this thorny path. The introductory chapter by the medical director of the clinic at St Mary's gives a concise summary of the main facts about the venereal diseases and their treatment which the almoner should know—knowledge which is essential in her work but is ordinarily hard to acquire. Succeeding chapters deal with the general duties of an almoner, and the work of record keeping, and contain much tabulated information about treatment centres, special hospitals and organisations. Others are devoted to the particular problems of following up, of maternity patients and of infected children. Miss Manchée's personal views are sound and instructive, but may be open to criticism on points of detail.

She rightly emphasises that the first interview is the most important, but it may be argued that the patients need not be questioned as to both medical and social circumstances *before* seeing the medical officer. Many would resent such cross-questioning, although they would be willing to give particulars to the medical officer or later to the nurse who is giving treatment, after which, if help is needed, they could be referred to the almoner. Then is the difficult question whether a visit should be the final step in following up when letters remain unanswered. As Miss Manchée says, "untold harm can be done through thoughtlessness or over-zealousness" and many would regard such visits as a serious manifestation of excessive zeal, except perhaps in the occasional case where a child's health is being jeopardised by parental carelessness or ignorance. In all these situations wise restraint is the first essential, and the almoner who is over active will do more harm than good. To those who possess the necessary qualities and would attempt this difficult task, the present book is likely to be a substantial help.

A FRIEND OF CHILDHOOD

Miss Clara Andrew, who died last week, had an idea in 1914 and spent the remaining 25 years of her life in working it out. The idea was to give childless couples the opportunity of bringing up children who had no proper homes of their own. It started with her Belgian refugee work but soon broadened in the atmosphere of war-time generosity. She had little difficulty in finding permanent homes for war orphans and then set about protecting not only the adopted children but also the adoptive parents from later interference. The act of 1926 giving both parties legal status is now a common place, it was actually the result of long and patient labour, and Clara Andrew was not content to leave it there. She helped to obtain the appointment of a departmental committee to consider further safe guards and its recommendations are now awaiting royal assent. It has been said that she found homes for more than 6000 children, of whom no more than 30 proved misfits. This was in itself no mean achievement, but she did more than this, for she and her co workers have almost redeemed the phrase "baby farmer" from its terrible associations.

ERRORS IN THE DIFFERENTIAL BLOOD COUNT

MANY American hæmatologists have claimed that more accurate differential cell counts are obtained when the smears are made upon cover slips than when they are prepared on slides. Boveri[1] has accordingly undertaken some comparative studies of white cells by the two methods. These comprised differential counts on himself on twenty six days at approximately the same hour of the day. Two films were made on slides, four films (two pairs of films) on cover slips. On each of the two slide films 600 cells were counted, making 1200 in all, and on each of the four cover slips 400 cells, making 1600. At the same time as a check the lymphocytes were counted in a Buerker chamber against the remaining types of cells taken together. It was thought that the percentage of lymphocytes obtained in this way would represent fairly accurately their percentage in the original drop of blood. The lymphocyte counts obtained from the cover glass counts and the Buerker chamber counts agreed closely, the average difference being only 0·5 per cent. The lymphocyte percentages obtained from the slides were constant and higher by approximately 10 per cent. In other words the lymphocyte percentage ranged between 20 and 30 by the counting-chamber and cover slip technique and between 30 and 40 with the slide method. There was little to choose between the two methods as far as consistency. For the slides the average difference was 2·15 per cent and for the cover glasses 2·2 per cent. The high lymphocyte count is due, Boveri believes, to the tendency of granulocytes and monocytes to congregate near the

1 Social Service in the Clinic for Venereal Diseases. By Dorothy Manchée. London: Bailliere, Tindall and Cox. 1938. Pp. 91. 3s.

1 Boveri, R. M. *Guy's Hosp. Rep.* 1938, 88, 112.

edges and ends of the film He thinks it difficult to compensate for this by counting in a standard way that includes representative portions of the film He concludes that the cover-glass method is the best, for it alone gives a differential count that correctly represents the relative proportions of the different types of white blood-cells in the original drop of blood. It is not, however, easy to carry out, and is therefore unsuitable for anyone but a highly trained worker He suggests that in hospitals, where blood examinations must often be made by the inexpert, it is wiser to sacrifice precision to uniformity The slide method should, he thinks, be used for routine purposes, remembering that the normal lymphocyte percentage then ranges between 25 and 40.

TISSUE RESPIRATION

AT the Dundee meeting of the British Association, to be held from Aug 30 to Sept 6, the sections of chemistry and physiology will jointly discuss tissue respiration The opener, Prof R A Peters, F R S, will be followed by Malcolm Dixon (Cambridge) and H Theorell (Stockholm) speaking respectively on catalysis and the flavoproteins After an account of cytochrome and similar compounds by Prof David Keilin, F R S, F Dickens (Newcastle-on-Tyne) will consider the interpretation of intermediary metabolism from measurement of tissue respiration, and J H. Quastel (Cardiff) that of narcosis. S Ochoa (Cambridge) will deal with carbon-dioxide evolution and cocarboxylase Prof H S Raper, F.R.S, will discuss the control of tissue respiration, and other aspects of the subject will be presented by D. E Green (Cambridge), Sir Gowland Hopkins, F.R S, H A. Krebs (Sheffield), T. Mann, and E P Poulton (Guy's Hospital)

OPIUM AND CODEINE

ATTENTION has from time to time been called in these columns to the use of codeine as a drug of addiction and the question of extending to it and its salts certain provisions of the 1931 convention for limiting the manufacture and regulating traffic in the drug. The matter has again been under the consideration of the council of the League of Nations and of its advisory committee on opium traffic Codeine was included in the first draft of the Hague Opium Convention of 1912 but was finally omitted under pressure from the German delegates Representations from Canada that codeine appeared to be replacing morphine among drug-addicts and restrictions placed upon its use in certain countries, such as Poland and Switzerland, led the advisory committee of the League to draft a protocol for bringing dihydrocodeine and its salts under control like other dangerous alkaloids This draft has been communicated by the Secretary-General to governments, and their observations have led to the preparation of a revised draft which the council of the League has recently approved for consideration by a conference about to be summoned

The advisory committee was in session during May and June when Major W. H Coles (United Kingdom) was elected chairman and Sir Thomas Russell, Pasha (Egypt), vice-chairman The other nations represented were Belgium, Bulgaria, Canada, China, France, Greece, Hungary, India, Iran, Mexico, Netherlands, Poland, Portugal, Siam, Switzerland, Turkey, United States and Yugoslavia. Sir Malcolm Delevingne and M. A L Blanco (Spain) also attended, the former in the capacity of an expert and the latter as an observer. Besides the usual progress report and the returns of illicit traffic and seizures the committee further considered the alarming situation in the Far East and the fundamental question of the limitation of cultivation of the opium poppy and of the production of raw opium.

BLOOD-DONORS COMING IN SLOWLY

DURING the first three days of the appeal for volunteer blood-donors some 5000 people registered as willing to contribute blood in the event of a national emergency. This has been regarded as a good or a bad beginning according to the commentator's forecast of future progress. Certainly the start has been unnecessarily slow, but later figures show a quickening response If war broke out at least 100,000 donors would be required in London alone and the empanelling centres are in a position to test and register at least 30,000 volunteers a day It does not need a prophet to be sure that if an emergency arose blood-donors in sufficient number would at once be forthcoming, but an adequate supply of blood of the proper groupings could not be made immediately available It might be well for practitioners all over the country to impress their patients and others with the fact that now is the time to do it—in the words of the prescription, *tuto cito jucunde* There may be an understandable reluctance to face a situation that may not and should not arise, but at least there need be none of the present hesitation as regards risk to the volunteer Long experience has shown that occasional giving of blood is harmless to donors, and all that is asked of them in peace time is the surrender of two or three drops for testing It is here that the family doctor's assurance would count for much The list of blood-transfusion and empanelling centres which has now been issued shows the very large number of places at which the volunteer can register any day in the week except Sunday, from 10 to 12 and from 5 to 8 o'clock. In London itself there are 51 such centres; in the home counties, 36; in provincial centres, 41 (with, in Liverpool, all the Ministry of Labour offices); in Scotland, 12; and in Wales, 4 In London the address of the nearest empanelling centre can be obtained at any post office, or by telephoning Central 8691.

BORNHOLM DISEASE

THE disease variously known as Bornholm disease, epidemic pleurodynia and acute epidemic myalgia is a comparative newcomer to the medical world. References to it are found as early as 1856, but it was first systematically described in 1930, when an epidemic was reported from the Danish island of Bornholm. Since then there have been outbreaks in various countries and the clinical picture is now firmly outlined, though the ætiology remains unknown Weterings,[1] who reports three cases from Holland, points out the similarity between Bornholm disease and abortive acute anterior poliomyelitis Bacterial examination of the blood, cerebrospinal fluid, fæces, and smears from the nose and pharynx have been negative in every case so far reported, and the probability seems to be that a virus is responsible. The cardinal features of the disease are as follows. It mainly affects children and young adults between 4 and 20 years, though it has been described in older people, most cases arise during the summer, and usually in epidemic form; the illness starts abruptly with severe pain, situated as a rule in the lower part of the chest and upper part of the abdomen on both

1 Weterings, P A A, *Ned Tijdschr Geneesk.* 1939, 83, 2326.

sides, but sometimes in the back or lower abdomen, and accompanied by rise of temperature to between 100° and 102° F, recovery from the initial attack takes place after about 24 hours, but there is usually a relapse on the third day, again lasting about 24 hours, and pathological examination is negative

The prognosis is wholly favourable, and the chief importance of the disease lies in the readiness with which it may be mistaken for more serious conditions—for example, acute appendicitis, perforated peptic ulcer, pneumonia or pleurisy Of Weterings's three patients one was admitted to hospital as a case of acute appendicitis, one as perforated peptic ulcer and one as diaphragmatic pleurisy All three seemed seriously ill on admission, and the first two showed pronounced muscular rigidity The first patient, a youth of fifteen, was operated on for supposed perforation of a peptic ulcer, and only the fact that the symptoms were very similar saved the second patient from an unnecessary operation Bornholm disease is uncommon but it should be thought of in the differential diagnosis of an acute abdomen

NATIONAL CAMPS

THE Minister of Health has told the House of Commons of the progress so far made in implementing the Camps Act The National Camps Corporation Ltd has inspected 155 sites of which 30 have been approved for use as school camps in time of peace and as evacuation camps in time of war, of these sites two have been given to the corporation and the others have been purchased or are shortly to be purchased The camps are being built to the design of the consulting architects, Sir John Burnet, Tait and Lorne, the buildings will be of Canadian cedar with cedar shingle roofs Each camp will be laid out by an architect selected from a panel approved by the Royal Institute of British Architects Work has begun on two camps in the county of Oxford, one in Hants and one in Bucks, and seven others will be started within a few days The first camp will be completed by the end of August

CHEMOTHERAPY AND THE WHITE CELLS

Dr Leonard Colebrook's letter on p 158 should be read by all who use sulphanilamide, and they are many It is more than three years since we published his first report, with Dr Mervc Kenny, on the effects of Prontosil in puerperal sepsis, and as a pioneer of the new chemotherapy his plea for caution demands respect from more recent adherents He is concerned, as will be seen, with the risk of inducing with sulphanilamide and its congeners a dangerous or even fatal diminution of polymorpho nuclear leucocytes At a time when tons of these drugs are being consumed in Europe and America every month, if not every week, it may seem that this risk is remote, since very few fatal cases have been reported But the question arises, Are they recognised? Are not the toxic symptoms usually put down to the illness for which the remedy is prescribed? Elsewhere in this issue Dr French records a study of the blood of children given large doses of sulphanilamide over longish periods, and like Britton and Hawkins, who gave smaller quantities to ambulant patients she notes a slight but constant depression of polymorphs, which might well become serious where the bone marrow was already depressed by infection The bright side of chemotherapy is represented by the paper on p 148 by Prof Baird and his colleagues at Aberdeen, where prontosil was introduced in 1936 Their few fatal cases, however, include one, hitherto unrecorded, in which high dosage (in 1937) produced agranulocytosis, and we fear that in private practice this disaster is still not uncommon though often misinterpreted Dr Colebrook makes practical suggestions for its avoidance, while on another page Prof Campbell and Dr Morgan write encouragingly of the prevention of another and less serious complication—methæmo globinæmia—by means of methylene blue

DANZIG SCHEME FOR EARLY DETECTION OF CANCER

ON June 1 a law came into force in the Free City of Danzig which enables women over 30 and men over 45 to undergo an annual examination for malignant disease free of cost to themselves It also provides for the creation of an administrative body to combat cancer by educational activities and otherwise The new law requires that treatment of the disease shall be in the hands of doctors only, treatment by correspondence and other irregular and unethical methods being forbidden Early notification is imposed on the practitioner who diagnoses cancer, and the cost of diagnosis is to be borne by the administrative body in question In a review of the considerations behind this new legislation Redenz[1] quotes instructive figures from Mecklenburg where a system of voluntary notification of all new cases of malignant disease has been started From April, 1937, to April, 1938, in this community of some 800,000 souls, 1040 women and 823 men were notified as suffering from cancer, in other words, the annual incidence was 0 23 per cent These cases were classified in two main groups according as the lesion was or was not accessible to palpation and inspection In the first group there were only 226 men but 611 women, whereas in the second group there were 597 men and only 331 women (The reason why these figures do not tot up to the score of those already mentioned is that in a few cases the exact seat of the disease was unknown) The classification shows the relatively unfavourable situation of men as regards the frequency with which they suffer from deep-seated cancers

Redenz, who is in charge of the State Maternity Hospital in Danzig Langfuhr, writes as an enthusiastic supporter of the new law and hopes it will prove a model for similar legislation elsewhere

1 Redenz, E., *Disch med Wschr* May 26, 1939 p 851

V.D TREATMENT DURING MILITARY TRAINING—The men who are being called up as liable for service under the Military Training Act 1939, may well include patients receiving treatment for venereal disease by private practitioners As it is desirable that the treatment should not be interrupted information regarding each case should be available to the medical board undertaking the examination and details of previous treatment should be made known to the medical officer at the depot where the patient is called up

The Ministry of Health does not think it practicable to circularise all practitioners, but considers it would be helpful if medical officers of health instructed those distributing arsenobenzene compounds to practitioners, and pathologists doing tests of specimens for private practitioners to send with the supply of the compound or with the report that a specimen is positive a request that, in the event of a patient being called up under the act, the practitioner should furnish him with particulars of the case on form V 15 Copies of the form can be had from the nearest V D treatment centre

SPECIAL ARTICLES

PREVENTION AND TREATMENT OF PUERPERAL SEPSIS

DUE TO HÆMOLYTIC STREPTOCOCCI

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THE incidence of puerperal sepsis due to hæmolytic streptococci depends on the presence of the organism at the time of labour, the general resistance of the patient, and to some extent the amount of trauma sustained Although better obstetrics will lessen damage to the genital tract, and good antenatal care will do much to improve the patient's resistance, the most important single factor is probably the presence of the hæmolytic streptococcus in the genital tract at the time of delivery.

It has been shown that most of the deaths from puerperal sepsis are caused by the hæmolytic streptococcus group A, and that this organism is absent from the genital tract before labour begins. Every effort should therefore be made to keep it from entering the genital tract while labour is in progress. This can be done by asepsis and antisepsis, the use of masks, and the exclusion of carriers of streptococci from the labour-room All these precautions should be taken in every case, so that if one barrier breaks down there will still be others. For example, while an efficient mask may prevent spread of infection for a short time, it may be a source of danger when the wearer is in attendance on the case throughout a long labour and he becomes unmindful of it.

EXCLUSION OF CARRIERS

In Aberdeen Maternity Hospital during the year 1938 stringent precautions were taken to prevent carriers of streptococci from attending patients in labour This involved the examination of all students and pupil-nurses entering upon training and the re-examination of anyone with signs of infection in the upper respiratory tract Where hæmolytic streptococci were found, the carrier was sent to a laryngologist, and where he discovered chronic inflammation or a history of recurrent attacks of tonsillitis, removal of the tonsils was recommended Where the nose and throat were reported healthy and the organisms were scanty, gargling or painting with antiseptics was carried out and the student or nurse allowed to proceed with training. The following are the findings for the year 1938.

Fifteen swabs were taken from 7 members of the medical staff, of whom only 1 was shown to have hæmolytic streptococci. His tonsils were reported to be enlarged and unhealthy, and tonsillectomy was performed No streptococci were found at a subsequent examination. A mild infection of the upper respiratory tract developed in 4 doctors, but none was due to hæmolytic streptococci.

Fifty-four swabs were taken from 49 members of the nursing staff, of whom 5 were shown to have hæmolytic streptococci. Of these, 2 had unhealthy tonsils, and the streptococcus belonged to group A. Tonsillectomy was performed, and in both cases swabs taken later did not show any streptococci. The other 3 cases showed only a few colonies of streptococci, and grouping was not done. The tonsils appeared to be healthy, and after local treatment for a few days the streptococci disappeared. The nurses were all allowed to proceed with their training. Infection of the upper respiratory tract developed in 4 members of the nursing staff. in 1 the infection was due to a hæmolytic streptococcus, but the organism disappeared after local treatment of the throat.

Eighty-two swabs were taken from 71 students, of whom 8 were shown to have hæmolytic streptococci. In 1 case the tonsils showed chronic inflammation, and local treatment did not clear up the infection. The student was then given sulphanilamide 1 tablet (0 5 gramme) three times daily for five days, after which a swab did not show the organism. In the other 7 cases the tonsils were clinically healthy, and, since the organisms were not present in large numbers, the students were allowed to go on with their training but were warned to be extremely careful in their technique.

Among 773 booked cases delivered in the hospital in 1938 there was 1 case of notifiable pyrexia due to the hæmolytic streptococcus This woman had been in labour for eight hours before she was admitted to hospital, and none of the members of the hospital staff who were in contact with her was a carrier of hæmolytic streptococci She did not have the organism in her throat The temperature settled quickly under treatment. During the same year the staff attended 464 other cases, made up of 260 booked district cases, 7 emergency district cases, and 197 emergency hospital cases, 5 of them developed notifiable pyrexia due to a hæmolytic streptococcus Although the numbers are too small for definite conclusions to be drawn, they suggest that the risk of infection with the hæmolytic streptococcus is much less when the whole labour is conducted inside the hospital. It may be objected that the two groups are not comparable, since the smaller one contains 204 emergency cases, many of which were abnormal; but against this the booked district cases are specially selected parous women, who had had previous easy labours, further, many of the booked cases delivered in the hospital were sent there early in pregnancy because of expected difficulty. Therefore the proportion of women having difficult delivery was about the same in both groups In any case, infection with the hæmolytic streptococcus does not depend so much on the type of labour as on the risk of exposure to the organism.

In an attempt to throw more light on the problem, an analysis of all cases of puerperal pyrexia in the city and county of Aberdeen requiring hospital treatment in 1938 has been made. This has been possible because all such cases are treated in the city fever hospital During 1938 32 cases were admitted (excluding abortions) in which the infecting organism was a hæmolytic streptococcus The total number of births in the area, less those in the maternity hospital, was 5387. This gives an incidence of notifiable pyrexia due to hæmolytic streptococcal infection of 1 in 168 as compared with 1 in 773 in the maternity hospital These findings agree with the figures which have been published by other hospitals recently and support the view that the risk of the patient developing a puerperal infection due to a hæmolytic streptococcus is at the moment much less in a well run maternity hospital than it is in her home.

EFFECT OF CHEMOTHERAPY

It was thought that an analysis of the maternal deaths might reveal whether the use of sulphanilamide had caused any reduction in the death rate For this purpose the maternal deaths in the city and county area of Aberdeen in the last eight years have been investigated They have been divided into two groups 1931–35 and 1936–38 inclusive Table I shows a reduction in the total death rate from 6 2 to 4 6 per 1000 This is due to a large extent to a fall

TABLE I—MATERNAL DEATHS IN THE CITY AND COUNTY OF ABERDEEN, 1931–38

Year	Births	Maternal deaths	Death rate (per 1000)	Death rate due to sepsis (per 1000)	Deaths from sepsis	Average yearly deaths due to haem strept
1931–1935	30,172	190	6 2	2 05	61*	7 6
1936–1938	17,527	82	4 6	1 02	18†	2 66

* 38 due to haemolytic streptococcus
† 8 due to haemolytic streptococcus
The total maternal death rate is high owing to the fact that all deaths from intercurrent disease, such as pneumonia, heart-disease, and malignant disease in pregnant women are included If such deaths were excluded, the death rate for 1936–38 would be 3 5 per 1000 instead of 4 6

in the death rate from sepsis It fell from 2 05 to 1 02 per 1000 On further analysis of the cases of sepsis it is seen that the biggest fall in the death rate is in the cases due to the haemolytic streptococcus There were 38 deaths from sepsis due to haemolytic streptococci in the first five years (1 26 per 1000) and 8 deaths in the next three years (0 45 per 1000) As regards the cases of sepsis due to other organisms, there were 23 deaths in the first five years (0 76 per 1000) and 10 deaths in the next three years (0 57 per 1000)—not such a sharp fall

While it still remains impracticable to conduct all midwifery cases in hospital, it is thought that many deaths might be prevented by the use of the sulphonamides To ascertain to what extent the improvement in the results of treatment of puerperal sepsis is due to the administration of sulphonamides, and in which type or types of infection this has taken place, a survey of all cases admitted to the puerperal ward at the Aberdeen city fever hospital during the years 1931–38 inclusive has been made in table II

TABLE II—CASES OF PUERPERAL SEPSIS ADMITTED TO ABERDEEN CITY FEVER HOSPITAL, 1931–38

Organism responsible for death	Group A Jan 1931–June 1936			Group B June 1936–Dec 1938		
	Cases	Deaths		Cases	Deaths	
Haemolytic streptococcus	240	46	(19 2%)	96	8	(8 3%)
Anaerobic streptococcus	313	7	31 (9 9%)	104	2	10 (9 6%)
Staphylococcus		9			4	
B coli		7			1	
Miscellaneous		8			3	
Total	553	77	(11 9%)	200	18	(9 0%)

This hospital admits patients with puerperal sepsis from a rather larger area than the city and county of Aberdeen, thus explaining the slight difference in figures from those in table I

During this period 753 patients with puerperal sepsis were admitted The patients have been divided into two groups Group A consists of 553 patients admitted during the period January, 1931, to June, 1936, and group B consists of 200 patients admitted during the period July, 1936, to December, 1938, all of whom had sulphonamide treatment Of the 553 patients in group A 77 died, giving a case-mortality of 13 9 per cent Of the 200 patients in group B 18 died, giving a case mortality of 9 0 per cent This shows that a reduction in the total case-mortality has taken place since the introduction of sulphonamide therapy

A further analysis shows that of the 553 cases comprising group A 240 were due to infection by haemolytic streptococci, with 46 deaths (19 2 per cent) Of the remaining 313 patients with infections due to other organisms 31 died (9 9 per cent) In group B 96 out of 200 patients were infected with haemolytic streptococci, 8 (8 3 per cent) of whom died, and of the remaining 104 with infections due to other organisms 10 died (9 6 per cent) Thus it is evident that, whereas the case mortality of infections due to organisms other than the haemolytic streptococcus shows only an insignificant difference (9 9 per cent) in the first group as compared with 9 6 per cent in the second), there is a fall in the case mortality from 19 2 to 8 3 per cent in infections with haemolytic streptococci

TABLE III—STREPTOCOCCAL PUERPERAL SEPSIS CLASSIFIED ACCORDING TO BASE OF DELIVERY, BEFORE AND AFTER THE INTRODUCTION OF SULPHANILAMIDE THERAPY

Year	Streptococcal cases	Easy deliveries		Difficult deliveries	
		Recoveries	Deaths	Recoveries	Deaths
1931	34	22	2	6	4
1932	47	27	3	10	7
1933	23	12	4	4	3
1934	51	28	7	13	3
1935	54	31	3	14	6
1936	31	17	1	12	1
Total	240	137	20 (12 7%)	59	24 (28 9%)
1936	19	8	0	0	2
1937	40	22	1	15	2
1938	37	17	1	17	2
Total	96	47	2 (4 1%)	41	6 (12 8%)

It is generally recognised that the risk of a puerperal infection increases in proportion to the amount of manipulation carried out and to the extent of the local laceration and tissue damage sustained To ascertain the effect of local trauma on prognosis it was decided to divide the cases into two groups (1) difficult labours, including all forceps deliveries, manual versions, craniotomies, and spontaneous deliveries where there was evidence of much tearing, and (2) easy deliveries, including spontaneous deliveries and cases in which it could be ascertained that no surgical intervention had taken place It was assumed that the local trauma would be more severe in the first than in the second group

Table III shows that, before the introduction of sulphonamide treatment, there were 157 cases of haemolytic streptococcal infection following easy delivery, with 20 deaths (12 7 per cent), and 83

following difficult delivery, with 24 deaths (28·9 per cent.) After the introduction of sulphonamide treatment there were 49 cases of hæmolytic streptococcal infection following easy delivery, with 2 deaths (4·1 per cent.), and 47 following difficult delivery, with 6 deaths (12·8 per cent.) As a result of sulphonamide treatment, therefore, a striking fall in the case-mortality of hæmolytic streptococcal infection has taken place, irrespective of the type of labour but more obvious where the labour has been easy. There has been a relative fall in the proportion of cases of puerperal sepsis due to the hæmolytic streptococcus after easy delivery admitted to hospital. This may be due to the fact that patients with sepsis after easy delivery are quickly cured with sulphanilamide and do not require hospital treatment. There has been a fall in the total number of cases admitted to the puerperal wards in the last two years. It is clear therefore that in spite of sulphonamide treatment the prognosis is poor in hæmolytic streptococcal infection when there has been extensive local trauma.

CASE-RECORDS

It was thought worth while to summarise the case-histories of the eight fatal cases in the hæmolytic streptococcal group, treated with sulphonamide, and to ascertain what were the chief factors responsible for the deaths.

CASE 1.—A primipara, aged 26, admitted to hospital in 1936 on the fifth day of her puerperium. There was a history of a difficult forceps delivery, a stillborn child, and a large postpartum hæmorrhage. She had a rigor on the second day of the puerperium. On admission she was very ill, with signs of a pelvic peritonitis. She was also suffering from a secondary anæmia: red blood-cells 1,530,000, hæmoglobin 27 per cent. Examination revealed a severe degree of perineal and vaginal tearing.

The patient was *treated* with Prontosil rubrum (10 c.cm. of a 2½ per cent. solution intramuscularly eight-hourly) and Prontosil album (sulphanilamide) 1 g. eight-hourly. Despite treatment she developed a phlegmasia alba dolens on the ninth day of her puerperium and a streptococcal empyema on the fourteenth day. She died the following day. Blood-culture was positive to hæmolytic streptococci. At no time during the course of the illness did the patient respond to treatment. No sulphanilamide was administered before admission to hospital.

In this case the factors responsible for the fatal issue were severe trauma with postpartum hæmorrhage, delay in instituting chemotherapy, and possibly inadequate dosage.

CASE 2.—A 6-para, aged 27, admitted to hospital in October, 1936, with a history of a very difficult labour: transverse lie, attempted internal version, decapitation, and manual removal of placenta. She developed a rise of temperature on the third day. She was admitted to hospital the following day and had a rigor the same evening. She had no sulphanilamide before admission.

Treatment.—10 c.cm. of a 2½ per cent. solution of prontosil rubrum intramuscularly eight-hourly, and sulphanilamide (1 g.) eight-hourly. She died of a typical septicæmia without localising signs on the tenth day of her puerperium.

The important factor in this case was probably poor antenatal and intranatal care, resulting in unnecessary trauma and massive invasion of the tissues.

CASE 3.—A 10-para, aged 40, had had a septic abortion when she was four months pregnant, and was admitted in 1937 on the seventh day of the puerperium. She had been previously in poor general health, and had a spontaneous abortion after bleeding five days. No medical man was consulted. She had had several rigors before assistance was sought. On admission she was very ill and suffering from a septicæmia. Three hours after admission an embolus entered her *left* retinal artery, and within seventy-two hours the eyeball ruptured and the lens was extruded.

Treatment.—Prontosil rubrum 10 c.cm. of a 2½ per cent. solution intramuscularly twelve-hourly and sulphanilamide 3 tablets eight-hourly. She died on the fourth day in hospital.

In this case there were three factors: no antenatal care; delay in sending for medical aid, and delay in instituting chemotherapy.

CASE 4.—A primipara, aged 34, admitted in 1937 on the sixth day of her puerperium. She had had her membranes artificially ruptured. She was delivered by forceps, having been in labour only three hours. There were numerous rigors before admission to hospital.

Treatment.—Sulphanilamide 1½ g. four-hourly by mouth and 10 c.cm. of prontosil rubrum intramuscularly eight-hourly. Despite intensive treatment she showed no response and died of a pneumonia seven days after admission.

In this case there was unnecessary trauma due to too early application of forceps and delay in instituting chemotherapy.

CASE 5.—An 11-para, aged 41, admitted to the maternity hospital in 1937 with a history of a central placenta prævia and much hæmorrhage. Bipolar version was performed. The child was stillborn. The patient developed a rise of temperature on the third day and was admitted to the City Fever Hospital six days later.

Treatment.—On admission she was given sulphanilamide (1 g.) by mouth eight-hourly. Streptococci were demonstrated in the blood-stream on the sixteenth day of her puerperium. The dose of sulphanilamide was increased to 1½ g. four-hourly, and prontosil rubrum 10 c.cm. was administered intramuscularly eight-hourly. By the thirtieth day her blood-culture was sterile, and sulphonamide was discontinued. On the thirty-fifth day she was discovered to have a complete agranulocytosis, and despite three blood-transfusions she died on the thirty-seventh day.

In this case death was due to faulty treatment of the placenta prævia and to overdosage of sulphonamides.

CASE 6.—An 8-para, aged 28, admitted to hospital in 1938 with a history of having been eight hours in labour with a breech delivery. The child was born before assistance was obtained. The patient had a rigor on the first day of her puerperium and was admitted on the second day, when she was found to have a septicæmia.

The *treatment* adopted was sulphanilamide 1 g. by mouth four-hourly. No improvement was observed by the twelfth day, when in addition to oral prontosil she was given prontosil rubrum (10 c.cm. of a 5 per cent. solution) intramuscularly eight-hourly. On the eighteenth day she developed a phlegmasia. The administration of sulphonamides was continued until the thirty-fourth day without the slightest response. She died on the forty-second day, there being evidence of numerous pulmonary infarcts at necropsy.

There is nothing here to account for the failure of chemotherapy.

CASE 7.—A primipara, aged 20, admitted to hospital in 1938. Labour lasted eighteen hours, and she was delivered by forceps of a live child. The patient was being looked after by a midwife. She developed a pyrexia on the first day of her puerperium but was not admitted to hospital until the seventh day. No treatment had been given.

Treatment—Sulphanilamide 1 g eight-hourly was administered until the fifteenth day, when a small piece of placental tissue was removed Her blood-culture was positive the following day, when the dosage was increased to sulphanilamide 1 g by mouth four-hourly and 10 c cm of a 5 per cent solution of prontosil rubrum eight-hourly The same day she was given a transfusion of one pint of blood Despite intensive treatment carried on for a further twenty-six days, she developed a septic streptococcal arthritis of both wrist-joints and one knee-joint She died of exhaustion on the sixty-third day of her puerperium

In this case a piece of placental tissue was left inside the uterus, and sulphanilamide treatment was not begun until the seventh day post partum

CASE 8—A 10-para, aged 40, admitted to hospital in 1938. She was in very poor health during her pregnancy She was a midwife's case, but the delivery had to be assisted by a low-forceps operation after she had been seven hours in labour She had a rigor on the second day of the puerperium, but the doctor was not recalled until the seventh day, when she was admitted to hospital No sulphanilamide was administered before admission

Treatment—She was given sulphanilamide 1 g by mouth four-hourly On the tenth day she was also given 10 c cm of a 5 per cent solution of prontosil rubrum intramuscularly eight hourly By the fifteenth day her blood-culture was sterile and her temperature and pulse-rate had almost settled On the seventeenth day, however, the temperature again rose and her blood-culture again became positive M & B 693 1 g four-hourly was substituted for the prontosil on the twenty second day without success, and she died on the thirty-fourth day of her puerperium

In this case there was unjustifiable delay in sending the patient to hospital and instituting chemotherapy

COMMENTS

On consideration of the above case histories we think that it would be fair to conclude that antenatal care was deficient in cases 2, 3, and 8 Better supervision during pregnancy might have prevented the malpresentation in case 2 and thus have avoided the subsequent manipulations. Case 3 did not consult a doctor during her pregnancy, and her condition must be considered to be unavoidable, illustrating the need for increasing educational facilities and for emphasising the dangers of abortion in unfavourable circumstances In case 8 supervision during the antenatal period would possibly have led to improvement in her general condition and thus have increased her resistance to infection

Better facilities during labour in cases 1, 4, 5, and 6 might have prevented infection In case 1 the severe perineal and vaginal lacerations in conjunction with postpartum hæmorrhage predisposed to infection Case 4 had obviously been mismanaged, forceps having been applied in a primigravida only three hours in labour In case 5 cæsarean section might have been considered, but this depended on the amount of interference before admission to the maternity unit and on other factors Case 6 illustrates the necessity for a qualified person to be present at every labour to avert the danger of the woman either infecting herself or being infected by the unskilled attentions of a neighbour

Better supervision during the puerperium might have led to earlier hospitalisation in cases 1, 3, 4, 7, and 8 We think that all will agree that there was obvious delay between the first signs of fever and admission to hospital Experience shows that the longer the appropriate measures are delayed, and the more advanced are the pathological changes, the less chance have specific measures of effecting a cure

As regards treatment after admission to the puerperal ward at the City Hospital, Aberdeen, it might be suggested that in cases 1 and 2 the dose of sulphanilamide was too small However, at that time sulphanilamide treatment was in its very early stages, and an attempt was being made to assess the optimal dosage A fatal issue in case 3 was unavoidable with any form of treatment Despite adequate doses of sulphanilamide in cases 4, 6, 7, and 8, the drug did not control the infection Circumstances were particularly favourable in case 6, although the patient was suffering from septicæmia, for she was admitted on the second day of her puerperium and appropriate treatment was instituted early In cases 4, 7, and 8 circumstances were not quite so favourable, fever having begun several days before admission It is more than possible that types of hæmolytic streptococci vary in their susceptibility to the drug Case 5 was rather an unfortunate one, the infection having been controlled, but the patient dying of an agranulocytosis following relatively heavy dosage of sulphonamides

CONCLUSIONS

In a well run maternity unit, where strict control of all contacts during labour and the puerperium is obtainable, the incidence of streptococcal sepsis can be reduced to a very low level.

During the past three years the death rate due to puerperal sepsis has been much reduced, particularly in patients infected with hæmolytic streptococci The improvement is mainly due to treatment with sulphonamides

The chief factors predisposing to failure with sulphonamide treatment are closely related to the extent of trauma, the late institution of adequate and appropriate therapy, and the degree of advancement of the pathological changes when first seen

SUMMARY

(1) The incidence of puerperal sepsis due to hæmolytic streptococci depends on the presence of the organism in the genital tract during labour, the patient's resistance, and the amount of trauma sustained

(2) Most of the deaths from such sepsis are caused by the hæmolytic streptococcus group A, absent from the genital tract before labour

(3) The access of the organism to the genital tract during labour can be prevented by asepsis, antisepsis, the use of masks, and the exclusion of carriers of streptococci from the labour room

(4) The risk of infection with the hæmolytic streptococcus is much less when the whole labour is conducted in hospital

(5) The maternal deaths in Aberdeen are analysed in two periods—1931–35 and 1936–38 There was a fall in the death rate from 6·2 to 4·6 per thousand, due mainly to a fall (from 2·05 to 1·02 per thousand) in the death rate from sepsis, the biggest fall in cases of sepsis being in those due to the hæmolytic streptococcus

(6) An analysis of the cases of puerperal sepsis in Aberdeen in two periods—before and after the introduction of sulphonamide therapy—shows a fall in the total case mortality from 13·0 to 9·0 per cent, and a fall from 10·2 to 8·3 per cent in the case mortality of sepsis due to the hæmolytic streptococcus

(7) To decide the effect of trauma on the incidence of puerperal sepsis, cases were analysed in two

groups according to whether delivery was easy or not It was found that with easy delivery the case-mortality was 12 7 per cent and with difficult delivery 28·9 per cent before the introduction of sulphanilamide, and 4 1 per cent with easy delivery and 12 8 per cent with difficult delivery after the introduction of sulphanilamide therapy. Therefore, in spite of treatment with sulphanilamide, the prognosis is poor in hæmolytic streptococcal infection in the presence of extensive local trauma.

(8) Eight fatal cases are summarised, and the chief factors responsible for death are pointed out.

WAR NEUROSES

THE Ex-Services Welfare Society held its annual medical conference on July 7, with the president, Prof EDWARD MAPOTHER, in the chair. The subject of discussion was the incidence of war neuroses in civilians and in each of the armed forces The chairman, in opening, asked for practical suggestions for the prevention of neuroses, and for answers to basic questions. What can be done to reduce mental stress? How far can individual predisposition be detected and the susceptible put to forms of service in which they can be useful? How can the causal factor of personal advantage be prevented by raising morale and by taking profit out of the neuroses? A new problem in a future war may, he said, be an increase of neurosis among civilians There is no evidence that any neurosis was caused by air-raids in the last war; on the other hand, future air-raids may be far more trying Much will depend on the efficiency with which our own aircraft repel raiders Defending gunfire is nearly as productive of neurosis as enemy bombs

SERVICE VIEWS AND EXPERIENCE

Surgeon Vice-Admiral P T NICHOLLS said that according to data given by Beaton admissions at Chatham for neurosis and psychosis rose steadily through the late war relatively to the numbers of the personnel Forty-one per cent were classed as psychoses, but the proportion today would perhaps be smaller Of the three neurotic groups—neurasthenia, hysteria and shell-shock, the first was by far the largest and 95 per cent of the cases in it were suffering from anxiety states Many anxiety cases closely resembled cases of Graves's disease Hysteria was much rarer than in the Army, perhaps because sailors as a class are more independent and less suggestible than soldiers Most neurotics were lost to the service In a future war the problem might be made more severe by insecurity from air-raids in harbour and by anxiety for the safety of wives and families The figures would be increased by flying stress neurosis in the Fleet Air Arm Steps should be taken to eliminate men with a constitutional tendency to neurosis, but it is not practicable to examine all troops psychiatrically or to attempt to restore neurotic patients to duty by psychotherapy. Every effort should be made to send psychiatric casualties quickly to a centre where expert diagnosis is available, and then to dispose of them suitably. This plan may present great difficulty among sailors serving in remote parts of the world There is a serious shortage of medical officers capable of performing this service

Major-General ROBERT PRIEST said that the Army has already begun to apply many of the points suggested by Prof Mira on the basis of his Spanish experience All officers receive lectures on mental disorder and impart their knowledge to the troops The question of selecting personnel and deciding, on the history of each man, whether he shall be employed in front or back areas is still under discussion If the officers are prepared by special notice, it is practicable to discharge patients before they are completely cured The incidence of nervous disorder would be much reduced by keeping up the strength of the forces and of the population by good and regular feeding Preliminary training—for example, by black-outs—should be applied energetically to the civilian population to eliminate the all-important element of surprise

Group-Captain H L BURTON gave figures for the incidence of nervous disorder in the Royal Air Force in 1937: in a total force of 60,000 the admissions for psychoneurosis were 125, of whom 41 were invalided—an incidence of 2 1 per thousand There were 24 cases of mental disease Mental and nervous illness is the commonest cause of invaliding in the Royal Air Force, perhaps because the standard of criticism is so high. Flying personnel are weeded out early in their training, and the incidence among fully trained flying staff is low. Neurosis is not closely connected with the duties of a patient, but rather with conflict. Most patients show a marked lack of confidence, but often the only prominent symptom is a general failure to perform duties efficiently. Among men classed as unlikely to make good fliers, temperamental defects account for 80 per cent These may be combined with psychomotor defects and are usually detected early A second group realise that they cannot cope with the faster machines they meet in later training A third group, breaking down after a career of some length, do so from unexplained loss of confidence, from a definite event such as an accident, or from private trouble Some develop a growing feeling that it is only a matter of time before disaster overtakes them The precise classification of nervous disorder is not regarded as important, for most men who break down are lost to the service Breakdowns among the lower ranks from psychological inferiority have increased. It is difficult to decide whom to discharge, for it is bad to discharge too freely. Some method of eliminating unsuitable recruits is needed

Among the flying personnel the watchword is prophylaxis All medical officers receive a brief course in psychology applied to their particular work They observe their personnel constantly for signs of stress and suggest modifications of the work where necessary They encourage men to discuss their troubles, and offer advice Very little intensive psychotherapy is performed: few medical officers can give it, and there is no conviction of its value In war-time the scheme of treatment would consist of a series of filters The first is the medical officer of the unit; the second is the consultant, to whom doubtful cases would be sent Treatment would be short and mild. men would either go straight back to duty after a rest and explanation, or be given a short period of leave, or be sent to a special hospital for psychotherapy. Prognosis would depend on the extent to which the patient had acquired control of his emotional level by his intellect or sentiment. Men should not be invalided back to civilian life, but retained in uniform and subject to duty unless they were quite hopeless and incompetent

Dr E PRIDEAUX said that during the war about 30 per cent. of those who broke down mentally were constitutional neuropaths These were mostly

persons who had been in some kind of clerical occupation and had been conscripted, their physique was inferior and they broke down at home Hysterics broke down after a short period of service overseas, anxiety patients after perhaps a year and a half Of the psychological inferiors, who would probably today be called high grade feeble minded, nearly all went overseas and a third of them served through the whole war, mostly in departmental units but quite usefully

Prof EMILIO MIRA (chief psychiatric inspector to the Spanish Republican Army) distinguished three periods in the Spanish war During the first period service was voluntary and the element of conflict was absent There were no figures, but the incidence of nervous troubles was probably low In the second period the army was organised and there was a high casualty-rate The incidence of discharge for war neurosis was 1 5 per thousand Soldiers from the North of Spain resisted neurosis better but suffered from it worse The incidence among front line troops was strikingly low, probably because their morale was better Its most common form was conversion hysteria, which often yielded to a few days' treatment Anxiety states were common, but usually developed into hysterical syndromes The third period was marked by shortage of food, the conscription of very young troops, and lack of confidence in victory There was no great increase in neurosis, as the psychological selection was good and front line troops were not psychiatrically infected The highest incidence was among anti aircraft units and sanitary services, the second among infantry and transport Symptoms among flying officers were due rather to exhaustion than to neurosis Nervous breakdown was very rare in the 10th and the 15th Corps, which consisted of Communists with strong political sympathies The source of neurosis being fear, a strong enthusiasm will counteract it Prof Mira considered that the best antidote to war neurosis is a campaign of political information to inspire devotion to the object for which the war is being fought This is particularly necessary in country districts There was no great increase in neurosis among civilians under totalitarian conditions As soon as social order and organisation were established, the frequency of nervous and mental disorder fell to the normal peace time level.

Dr E GUTTMANN said that as far as he could judge from the scanty German statistics available, acute neurotic reactions in front line troops of the German army in the late war were rare The incidence in the navy was about half that in the army, and the proportion of neurosis to psychosis was as ten to seven Air raids on civilians did not appear to cause any increase in admissions to psychiatric clinics, an increase of anxiety was, however, noticed among inpatients He gave some statistics from earthquake districts

PROPAGANDA AND DISCIPLINE

Dr A MCGLASHAN said that the two main psychological effects of war flying on a pilot are to cause extravagance of behaviour and lability of the emotional state A pilot during an expedition is intensely suggestible, for he is very young, he is alone and unsupervised, and his only task is to discharge his bombs It is difficult to be heroic about dropping bombs on women and children, and pilots have an instinctive distaste for the work Psychological ingenuity could be used to take advantage of the mental vulnerability of the pilot and induce panic in him His suggestibility should be intensified by propaganda and worked upon by suitable methods during air raids A committee of psychologists could probably devise effective methods

Dr THOMAS BEATON said that an unusual number of patients attended his outpatient clinic in Portsmouth last September The number may rise in a war through the effect of general tension on existing nervous instability High emotional tension did not produce neurosis or psychosis in any of the casualties of the Zeebrugge raid, and will only produce mental disturbance in predisposed persons Anxiety neurosis in the Navy was really due to exhaustion as the end result of protracted stress, and very few cases could be restored to duty A large proportion showed a definite enlargement of the thyroid A high proportion of psychotics were cured Neurotics must have security but not comfort good discipline is essential, and success would largely depend on the popular attitude to the neurotic being sound He must not be pampered the term "shell shock" was one of the most important causes of the condition in the last war Dr Beaton said he was a little frightened of the responsibility which courts, schools, administrators and now the fighting services tend to throw on the psychiatrist, who is only a human being He can pick out a definite psychotic but cannot really claim to assess the possibilities of neurosis in a soldier or sailor

Dr IVOR DAVIES pointed to the very high incidence of minor neurosis in the population today. Half the outpatient cases in the Cardiff Royal Infirmary are functional, and these do not receive treatment Many of them are cases of gastric neurosis The country should deal with them in peace time, for in a war many of them would become ineffective Hyperpietics are potential psychopaths Thyrotoxics would be very largely incapacitated in a war There is already a high incidence of goitre, which would be likely to become toxic under continuous threat of bombing Allergic patients and sufferers from chronic bronchial catarrh easily develop neurosis The schools should devote more attention to teaching children self control and self reliance—lessons they do not always learn at home A R P shelters should contain some persons with a knowledge of psychology, to deal immediately with neurotics They could be selected from health visitors, social workers, sanitary inspectors, clergy, or voluntary aid detachments

Dr W M MCALISTER thought that the prospect of nervous disorder in a war is not as bad as some people fear Panic due to air raids does not necessarily cause a rise in mental disorders The public must be educated to prepare them for the situations which may arise

Dr C S MYERS, F R S, recalled that in the last war the incidence of neurosis in badly disciplined regiments was high, in well disciplined regiments very low The incidence might be reduced by training fighters in a proper attitude to the enemy Education should be framed with the object of counteracting the air pilot's objection to bombing women and children Save for a few exceptions, no pension should be allowed for psychoneurotic disability The vocational psychologist could probably apply his special experience to the problem of selection, and should take part in training psychiatrists

Dr J D STIRSON said that most of the would be flying officers who break down early are of the sub intellectual type Hyperthyroidal patients are unlikely to make good patients When once a medical officer has been called in and the suggestion

of nervous disorder has been made energetic action must be continued until cure or definite disposal.

Dr M W BULMAN remarked that, if Joan Grant's novel "Winged Pharaoh" could be believed, the Egyptians knew methods of psychologically disabling their enemies seven thousand years ago. The small incidence of neurosis in the Navy may have been due to the fact that the stress was intermittent and the personnel were picked regular volunteers who were accustomed to the work and were not contaminated by conscripts. Conscripted men should have an opportunity to choose their units, for unconditional compulsion is a cause of neurosis. Similarly, civilians should be allowed to choose whether they will be evacuated or not.

Dr HENRY YELLOWLEES thought that the sailor was spared much anxiety by the comforting reflection that if he were killed it would be in company with many others. The soldier had to face being picked out from among his comrades. Education in the possibility of war neurosis might do as much harm as sex education has done, and might train young people to expect a psychological disaster. The objection to the use of vocational psychology is, he considered, that war is not a vocation, and even the vocational psychologist could not turn the psychological energy of the whole country into channels which no-one would choose if he could help it.

Dr GEORGE GORDON deprecated a defeatist attitude towards the possibility of selecting personnel. Much can be done, he said, by using the enormous data on invalidism which already exists, and by testing for such reactions as dermatography and such signs as hyperthyroidism and disturbances of the autonomic system.

Prof. MAPOTHER, in closing the discussion, said that it would be impracticable to deny compensation to psychoneurotics, but it should be refused during a war, and they should not be discharged.

MENTAL HOSPITALS ASSOCIATION

THE annual meeting of this association was opened by the LORD MAYOR OF LONDON at the Guildhall on July 6. Mr. J W BLACK, J.P. (Leicester and Rutland), took the chair.

Divorce for Insanity

Sir LAURENCE BROCK, chairman of the Board of Control, in an address to the meeting said that visiting committees and mental-hospital officers are disturbed by the uncertainty of the legal position of a patient under the Matrimonial Causes Act, 1937. A patient may be divorced if he is incurably of unsound mind and has been continuously under care and treatment for at least five years immediately preceding the presentation of the petition. A person is under care and treatment while he is detained in pursuance of any order or inquisition under the Lunacy and Mental Treatment Acts. In the case of Shipman v. Shipman (1938), said Sir Laurence, it was not seriously argued that the patient was likely to recover, but she had been sent from time to time to a relative, sometimes for periods running into months, and she had spent just under 400 days outside the hospital during the statutory five years. Moreover, the visiting committee had invented a new and wholly extrastatutory form by which they had allowed her to leave the hospital on "provisional discharge". The substance of the judgment in this case appears to be that short absences, such as week-end leave, may be disregarded, but there must come a point at which absence on trial will break the continuity of the five years and do away with the right to divorce.

In certain cases the medical officer may be put in an embarrassing position, but the scope of the Shipman judgment has been somewhat narrowed by the observations of the president of the Divorce Court in Green *v.* Green (1939). In that case the patient had been sent to a home maintained by the Mental After Care Association: as he had been under some kind of control the court held that the continuity of the five-year period had not been broken. The president regarded as important the fact that the home was exclusively occupied by London County Council patients and the association were acting as agents for the council. The position of a patient who is sent to an ordinary holiday home admitting patients from different hospitals is still extremely obscure. The Board of Control have issued a circular (No. 861) on the Shipman judgment. The duty of the superintendent of a public mental hospital is clear: he must be guided solely by the interests of the patient and owes no duty to the other party to the marriage. While it would be unwise to do anything which might obstruct divorce proceedings, he ought not to be deterred from doing his best for the patient by any considerations of possible ulterior consequences to other people. The medical officer in charge of a licensed house, though no less anxious to do his best for the patient, may find his work undone by the petitioner exercising his or her right to withdraw the patient when the doctor asks consent to give leave of absence on trial. Sir Laurence hoped that the legal obscurities of this question may be cleared up before long. He expressed the personal opinion that some amendment of the part of the 1937 act will have to be made on one of two lines: either the right to divorce must be made to depend on a certain period of continuous treatment, or the act must be brought into line with the Scottish act and contain a presumption that the patient is incurable after a certain period of continuous treatment unless evidence to the contrary is produced. In any case, absence on holiday or on trial ought not to be held to break the continuity of the five-year period.

Dr. T. C. GRAVES (Birmingham), in opening a discussion on the Matrimonial Causes Act, 1937, in relation to mental-hospital practice, pointed out that a period spent as a temporary patient may not count in the five years' detention period, for the temporary recommendation may not be an "order" under the act. If it is legally an order, the original purpose of creating it is defeated. The act turns mental hospitals into places where not only a patient may be "detained" but where he may lose his life partner and perhaps his only legal friend within a few years. The stigma of the mental hospital is undoubtedly increased, and the act may induce relatives to apply for discharge before a patient is well enough. Visiting committees should see the patients who may be respondents to a divorce petition, and review the circumstances of their illness and detention. This review is of great support to the medical officer who has to give evidence. The distinction between voluntary and temporary patients on the one hand and certified patients on the other, Dr. Graves maintained, is wholly arbitrary, has no medical basis, and under the new act is grossly unfair. The Mental Treatment Act, 1930, should

be amended so that all patients except really voluntary admissions come into mental hospitals on a temporary recommendation, with a maximum of two years for treatment according to the knowledge and capacity of modern medicine and surgery and without the present obstacles to temporary treatment The need for further residence after the initial term should be decided by the Board of Control

Many general paralytics live on for years after modern treatment How, asked Dr Graves, is such a patient to be protected against divorce by the partner who gave the patient syphilis perhaps twenty years before, and what evidence will be accepted that the petitioner is responsible for the patient's condition? A petitioner may also have been guilty of "such wilful neglect or misconduct as to have conduced to the unsoundness of mind" by neglecting the patient, interfering with treatment or preventing others from helping or treating the patient It may be advisable for the medical practitioner, before pronouncing on incurability, to state the treatment which has been given but has been unsuccessful In a grimly defended suit the practitioner might be subjected to a severe cross examination with the object of proving that the petitioner has wilfully put the patient in charge of someone who has neglected to take active measures to benefit him

When a decree of divorce has been pronounced, the doctor should not give up attempting cure, he should completely forget the legal interruption and maintain an active interest in the patient's well being and possible recovery Many patients recover after five years New agents and modes of treatment may be applied to mental disease with quite unexpected results After decree *nisi* steps may be commenced to obtain an order for the maintenance of the patient and children The guardian *ad litem*, usually the Official Solicitor, represents the patient and, if the patient recovers after divorce, will arrange to restore his/her property and rights of access to children and, where they exist, the rights to maintenance

Dr J I RUSSELL (York) said that the president of the Divorce Court, in an unreported case Crawford *v* Crawford, said he would be favourable to the suggestion that temporary treatment if extended by the Board of Control is detention under an order It happened, however, that by adjourning the case till the next session the five year period could be completed without invoking the period of temporary treatment, this course was followed, and it became unnecessary for the president to decide the point

The meeting referred the whole question of the amendment of the law to the executive committee for action, in coöperation with the visiting committees of the country

Present Situation of Mental Hospitals

In the course of his address Sir LAURENCE BROCK said that the general position in mental hospitals shows a slight but welcome improvement since last July The aggregate shortage of beds has been reduced from 3608 to just under 3000, but the position remains serious Progress at Lathom Park and Margaretting has been slow, and the proposed site of the third mental hospital has had to be abandoned owing to difficulty of drainage The position must therefore become worse in the next two or three years Steady progress, however, continues to be made in the provision of admission units and nurses' homes Even when the discharge rate is unaffected, the relapse rate falls when an early treatment centre is opened. An indirect but important advantage is the stimulating effect of the existence of modern treatment facilities on the keenness of the medical staff A keen doctor will not remain in hospital, or if he does remain he will not retain his keenness, unless he is given a fair chance of doing his best for his patients and if he knows that his new admissions have to be brought into overcrowded wards in contact with chronic and seriously ill patients

English hospitals are very understaffed, he continued, in comparison with most of the continental hospitals In the university clinic at Waldau, just outside Berne, with somewhat less than a thousand beds, the medical staff consists of a director and nine other whole time doctors Visiting committees do not always appreciate the hard work thrown upon the medical staff by an outpatient clinic. Medical staffs badly need strengthening, to enable the outpatient clinics to hold far more frequent sessions and do much more in the way of treatment Such an increase would do much to remove the reproach that many outpatient centres do very little more than diagnosis It would also reduce considerably the number of patients who have to go to mental hospitals

Dealing with air raid precautions, Sir Laurence said that in most hospitals it would not be practicable to attempt any considerable transfer of patients from one part of the building to another in the short time which would elapse between the warning and the raid, it would certainly not be practicable to attempt to transfer patients to trenches The Government will not relieve local authorities of any of the expenses of maintaining institutions, the cost of emergency precautions must fall on local funds The local authority has no more claim to relief than the employer of labour In conclusion, he said that the national emergency must not lead to any sagging down in mental health services Visiting committees should survey the field as a whole and frame a comprehensive programme, aiming wherever possible at prevention At the moment nothing is more important than the development of outpatient centres It will not add to the strength of national defence to neglect the mental health of the nation

MEDICINE AND THE LAW

A Miscarriage

AT a Chester inquest last week two doctors were criticised for failure to coöperate with the Flintshire county council's scheme for welfare in maternity cases The deceased, a married woman aged 38, had died in an ambulance on the way to hospital The two doctors had been attending her after a miscarriage They had omitted either to call in a specialist or to send the patient to hospital promptly Dr W H Grace, pathologist, who conducted a post mortem examination, stated in the witness box his opinion that the omission of the measures which the county council's scheme contemplated was responsible for the condition finally resulting in the patient's death In the coroner's view the evidence indicated the importance of coöperating in the local authority's scheme, this was a case which should have been tackled and finished at the earliest moment The jury added to their verdict of "death by misadventure" a rider that death was due to negligence not amounting to criminal negligence

One of the two doctors in charge of the patient

had been in medical practice for forty-six years and had then retired. He was acting as locum tenens for the second doctor from June 2 to 9, the critical week in the patient's illness. The second doctor, having been informed by his colleague that the patient's condition was comfortable, did not visit her on the 10th, as he was not sent for. He saw her on Sunday, June 11, and on other days in that week. On the 17th he was called as the patient was worse. He then decided that she must go to hospital and he communicated with the county medical officer and made the necessary arrangements. Both doctors contended that it was not the usual practice either to send such cases to hospital within twenty-four hours or to call in a specialist. "This was an accidental case," said one of them, "a case in a hundred." "We cannot," said the other, "have a specialist on every abortion." While both of them were aware of the county council's scheme and were in sympathy with the greater attention now being paid by local authorities to welfare in maternity cases, they seemed inclined to dispute the value of the medical opinions on which these schemes are founded. Dr. Grace, on the other hand, was clear that there was a recognised medical practice in these cases, and the coroner (who evidently accepted his view) remarked that the attitude of the two doctors would frustrate the whole scheme.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index.

FROM A WOMAN PUBLIC-HEALTH OFFICER

III

It would be interesting to know how many members of our profession bothered to read the exhaustive report on West Indian conditions prepared by the British Medical Association for the recent peripatetic commission. Probably not many, though it was a remarkable document, and the subject is one of grave concern to all of us, now that the relations of Britain to her colonies are an international question. The story is not a pretty one. Curable diseases not cured, preventable diseases not prevented, ancient plagues on the increase, malnutrition rife in a land of natural plenty, housing that would be intolerable for savages, and all this in an Empire of which we are justly proud. Judging from the report and other evidence offered to the commission conditions on the whole seem to be worse than when I toured the islands with a medical colleague nearly twenty years ago. Now, these West Indian islands are as lovely as a dream—lovely as film stars and as diverse in their types of beauty, in race, in religion and in their personal relationships. One might add that they are as sensitive to rivalry; the European enthusiast who always begins by advocating wide schemes of amalgamation has his troubles ahead of him.

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We were fortunate in that the deficiencies of post-war transport marooned us for three weeks in the Panama Canal zone; we were thus enabled to measure West Indian conditions against the standard of the finest hygienic administration in the world. It was amusing to find that the Canal Zone is the doctor's paradise, and the older American officials who had seen the enterprise through from the beginning were quite clear as to the reason. "It was really the doctors who built the canal. The French engineers were as good as ours if not better, but they hadn't a chance. That bit of the old De Lesseps Canal over there cost a life for every yard. Then Dr. Gorgas came along and cleared out the Yellow Jack and malaria, and taught the labourers from the West Indies ('British objects' they call themselves) how to keep alive. Gorgas showed them how to eat so as to increase their work-output, and the canal got built. So do we listen to the doctor's say-so? Yes, Ma'am."

Still, it was a shock to learn, for example, that no one is allowed to remain ill in bed in his own house for more than two days. On the third day the doctor must report the case and the patient is wafted away by ambulance-train to one of the magnificent hospitals at either end of the Zone. No bush or tree grows in the Zone except by permission of the medical officer of health. He is also empowered to inflict and collect fines for breaches of the sanitary regulations and even the local mayor can be fined up to 50 dollars if he gives trouble. I tell you, it would warm the cockles of a "sair hadden doon" medical officer's heart to watch the sort of police-court held every morning in the public-health department, with the M.O.H. acting as magistrate and sanitary inspectors collecting the fines on the spot. Even the ice cream supply had been taken over by the health department and it was issued daily as a government ration. (Socialists may care to note for propaganda purposes that it was the best ice-cream encountered in three continents.)

Walking through the completely fly-less market at Panama with the health officer one came on a banana-skin lying in the central aisle. Can you imagine what would happen if one of H. M. Bateman's admirals found a banana-skin desecrating his quarter-deck? The ensuing scene was just like that. . .

A few weeks later I was escorted through the market of a large West Indian capital town by another health officer; one's feet slithered in the decaying refuse, flies swarmed everywhere. "Now would you like to see where the flies come from?" asked the M.O.H. cheerily. We drove out to a huge dump a mile or so outside the town where flies and rats swarmed like the plagues of Egypt. The town council were going to do something about it next year—I believe it is there still. In another colony we visited a great sugar plantation. Stables for mules, with masses of flies breeding in the neglected yard, could be seen on one side of the manager's house; on the other was a hospital for East Indian immigrants with many cases of enteric in its unscreened wards. Oddly enough the manager himself lay dying of enteric.

We had been sent out especially to investigate the problem of venereal disease, but serious as that was it seemed to us one of the least of the West Indies' troubles. The deficiencies in environmental hygiene, the vast amount of preventable disease such as hookworm, yaws, tuberculosis and (in some islands) malaria, and the huge infantile mortality, seemed much more important. Hookworm is a particu

larly obnoxious scourge to a country One cannot tell what the potentialities of a population really are till it is eliminated I saw in one of the smaller isles a village inhabited by "red shanks," the white descendants of Cromwell's political deportees They were a gentle listless people, with pale blue eyes and skins like badly tanned leather, and it was very tempting to dogmatise about "degenerate stock" But one was told that when cleared of hookworm they become unrecognisable—vigorous and alert in a few months Alas, the medical officers of the Rockefeller anti hookworm campaign have apparently had to leave the islands in despair from lack of coöperation They had told us that the task though difficult was in no way impossible if proper help had been forthcoming

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Leprosy is an affliction so tragic that greater efforts should surely be made to eradicate it Many of the lepers are infected very young and have an appalling life of boredom while waiting for a dreadful end We visited every leper colony in the islands and some of them had not had a visitor for years, the courage and devotion of the officers who were working in loneliness to mitigate their charges' hopeless lot were beyond praise In another colony years later I found that the governor's wife had broken down an ancient taboo, had brought in a committee of ladies to organise games and cinema shows and occupations for the lepers This seems the only way to remove prejudice and to terminate the practice of concealment which is fostering this disease

* * *

One has been hearing a great deal—though not too much—about the housing of the native worker This is a welcome change, for there was a conventional theory in the past that coloured people could live anywhere and on anything, that they revelled in squalor and had no desire for a better standard One noted suspiciously that these views closely resembled the arguments brought out to oppose slum-clearance and rehousing schemes at home The health officers and experienced practitioners one met didn't hold with them Then one day, on a visit to a famous estate, I managed to slip off to the workers' village and have a chat with the people themselves One began with the women and babies, who were friendly as *always* Presently a young man broke off from a group of onlookers and said insolently "Have you come down here to laugh at de black folks living like pigs?" After a word or two of explanation they took me round their disgusting quarters quite willingly and showed me just what they objected to and what they wanted Resentment was freely expressed that the company's officers had rehoused themselves in beautiful screened bungalows and had done nothing for the workers This was no manufactured agitation but the spontaneous expression of simple people up against the fundamental realities of life

In view of the recent riots it is well to recall the freedom from crime (except larceny), the decent behaviour and the kindly patience of the West Indian Why have we made such a mess of a land where every prospect pleases and man is no more vile than usual? Most people know *some* of the answers but no one knows *all* the answers to that query Economic insecurity is one of the more obvious explanations The main industries—sugar, cocoa, bananas—are on the verge of bankruptcy, only oil pays steadily The explanation lies deeper, however, for even during a boom period—and there was great prosperity when I was out there—they did not spend money on health or indeed on any other public purpose (The hospitals—and deplorable they are—are all run by the government) Not one penny of the great fortunes made in the war was expended on any charitable or philanthropic project whatever And the income tax—if any—was only 1*s* in the pound!

More fatal even than poverty was the lack of a communal sense of responsibility for the well-being of the workers This is partly due to racial complexities, and partly to an obsolete political philosophy One met prominent persons who really believed that trade unions are dangerous revolutionary organisations, and that unless corrupted by bolshevik gold coloured folk would be content to sit like Ferdinand the Bull under the cork trees, just smelling the flowers, and never never asking for a share in the higher standards of living that the rest of the world enjoys This is an illusion of the type which has drenched Russia and Spain in blood The Almighty could of course have made such a people but I do not think He ever did

One feels that if it is humanly possible Britain should in the near future take effective action to assist the colonies in clearing up these outstanding arrears of disease and misery One can plead that here the medical officer of health is on the side of the angels—that he stands for social and moral security In the stately words of old Simon (recently recalled by Prof Major Greenwood) "side by side with pestilence there stalks a deadlier presence, blighting the moral existence of a rising population; rendering their hearts hopeless, their acts ruffianly and incestuous and scattering, while society averts her eyes, the retributive seeds of increase for crime, malevolence and pauperism"

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 1, 1939

Notifications.—The following cases of infectious disease were notified during the week. Smallpox, 0, scarlet fever, 1751, diphtheria, 882, enteric fever, 30 (29 "expected"), pneumonia (primary or influenzal), 449, puerperal pyrexia, 162, cerebrospinal fever, 20; acute poliomyelitis, 3, acute polio-encephalitis, 2, encephalitis lethargica, 6, dysentery, 57, ophthalmia neonatorum, 90 No case of cholera, plague or typhus fever was notified during the week

The number of cases in the Infectious Hospitals of the London County Council on July 7 was 2922 which included Scarlet fever, 718 diphtheria, 849 (carriers 11), measles 17 whooping cough, 784, puerperal fever, 19 mothers (plus 8 babies) encephalitis lethargica 306 poliomyelitis 3 At St Margaret's Hospital there were 24 babies (plus 12 mothers) with ophthalmia neonatorum

Deaths.—In 126 great towns, including London, there was no death from smallpox, 1 (0) from enteric fever, 5 (0) from measles, 2 (0) from scarlet fever, 16 (1) from whooping-cough 16 (2) from diphtheria, 21 (6) from diarrhœa and enteritis under two years, and 9 (3) from influenza The figures in parentheses are those for London itself

Huddersfield reported the only death from typhoid Sunderland and Stoke-on Trent each had two deaths from whooping cough Fatal cases of diphtheria were scattered singly over 14 great towns Birmingham reporting 2

The number of stillbirths notified during the week was 237 (corresponding to a rate of 30 per 1000 total births), including 28 in London

LETTERS TO THE EDITOR

CHEMOTHERAPY AND THE WHITE CELLS

SIR,—Although very few are now in doubt as to the immense value of the sulphonamide group of drugs in certain infections, those who are watching the literature dealing with them must be gravely concerned about the increasing number of reports of agranulocytosis associated with their use Once again we are reminded that there must always be danger in the administration of large quantities of a foreign chemical substance—we have to pay a price

Dr Sutherland's report in your issue of May 27 tells the story of the fourth case that has occurred in this hospital during the last two years (three in which the elimination of polymorphs from the blood-stream was complete and one of neutropenia—40 per cent. polymorphs). A fifth case was recently admitted with complete absence of polymorphs (W B C 850) after receiving 40 g. of sulphanilamide in seventeen days before admission. She died within thirty-six hours.

An incomplete survey of the literature shows that during the same period at least twenty-seven cases in adults and three in children have been reported or briefly referred to, making a total of thirty-five up to date From reports reaching me privately I conclude that a larger number of cases have been recognised in this country but not published; and—what is still more disquieting—there can be little doubt that others again have died unrecognised because leucocyte counts were not made. Therein lies the danger. As Dr. Sutherland points out, the clinical picture of agranulocytosis presents nothing characteristic—the so-called agranulocytic angina often does not occur or develops only shortly before death; it was present in only one of our five cases If white-cell counts are not made at short intervals, the patient's rising fever and deteriorating general condition may readily be ascribed to an exacerbation of the septic infection for which he or she is being treated The three cases referred to by Dr Crofton in his letter in your issue of June 24 illustrate well the insidious onset of this condition; he also points the way to the avoidance of the danger.

Very little is yet known about the pathology of agranulocytosis. It has been reported occasionally in association with streptococcus infections apart from any treatment by sulphanilamide or amidopyrine or related drugs, but the recognition of so many cases since the introduction of the sulphonamide group of drugs makes it almost certain that the administration of these drugs has usually been the deciding factor. Whether the presence of the drug itself in the circulating blood, or some derivative of it, is directly responsible, or whether again the condition may be due to a combination of factors, possibly including something unusual in the metabolism of the patient, we do not yet know. Until the condition can be induced in experimental animals these questions will probably remain unanswered.

Meanwhile, a survey of the recorded cases yields some points that are worthy of attention:—

(1) It is clear that agranulocytosis resulting from the sulphonamide group of drugs is a very fatal complication—more than 50 per cent. of the patients having died.

(2) Agranulocytosis may be met with after treatment by any of the sulphonamide group of drugs. Most of the recorded cases have occurred in association with sulphanilamide itself (perhaps because this drug has been more extensively used than any other), but already six cases have been recorded after the administration of M. & B. 693, as well as three cases of neutropenia. So far as I am aware, only one case has occurred when Red Prontosil alone was given.

(3) The relationship of the amount of drug administered and the duration of treatment to the development of agranulocytosis is striking. In twenty-four adult cases reported in sufficient detail the average dose administered was 48 g., and the duration of treatment was twenty days. In only two cases was the total amount less than 30 g (20 g. of M. & B. 693 in one case; 18 g. of sulphanilamide in the other). It is also worth noting that in no less than eleven cases out of nineteen in which the details of treatment are given the fall in the leucocyte count took place during a second or third or fourth course of treatment.

These data seem to point to a fundamentally important conclusion—namely, that there is not much margin between the amount of sulphanilamide which appears to be necessary to control a severe streptococcus infection (20–30 g.) and that which, in some people, involves a serious risk of agranulocytosis (30–60 g) (Comparable figures for M. & B 693 cannot yet be given) If that conclusion is right, it shows, I think, where we have gone wrong in our employment of these valuable new remedies We have continued them too long in cases which have not made a prompt response. Our experience at Queen Charlotte's Hospital has been that, if a patient's temperature chart and general condition do not show unmistakable improvement within the first five or six days of treatment, it is unlikely that there will be any response from further treatment. When hæmolytic streptococcus infections have not responded satisfactorily, it has usually been, in our experience, because the organisms are not sensitive to the drug (as shown by an in-vitro test). Other puerperal infections, except some by staphylococcus and the urinary infections by *B coli*, have almost invariably not responded, and, in my opinion, should not be treated by these drugs.

Since it is not practicable to make frequent white-cell counts in every case treated, I suggest the following procedure as a reasonably safe compromise—at any rate for the treatment of febrile conditions. If a patient's fever is subsiding satisfactorily under treatment and the general condition shows corresponding improvement, there is no need to do white-cell counts for the first six days—and the drug may be continued for a further two or three days without anxiety If, on the other hand, the temperature does not show a prompt response, or there are other disturbing symptoms, such as headache, white-cell counts should be done every second or third day from the beginning of treatment. Similarly, in every case in which more than 25 g. has been given or treatment prolonged for more than ten days, white cell counts should be done at short intervals.

May I add a further note with regard to the treatment of agranulocytosis since varying opinions are being expressed about the value of Pentnucleotide and of transfusion Three of the four patients who developed the condition in this hospital have recovered (the fourth was a case of endocarditis), and the astonishing recovery of Dr. Sutherland's patient when her condition seemed absolutely hopeless has taught us that one need not despair, even if the leucocyte count continues to fall after the drug has been stopped. The intramuscular injection of pentnucleo-

tide (0 35 g twice daily) certainly seemed to induce a definite rise in the leucocyte count *before blood-transfusion* in one of our cases, but we are inclined to think that both measures have proved useful Since we seek especially to provide the patient with normal leucocytes, it seems to me reasonable to use defibrinated rather than citrated blood, taken from donors in whom a leucocytosis has been induced—e g , by intramuscular injection of nucleinic acid (Parke Davis's "Veterinary Nuclein") 2 c cm four or five hours earlier (Colebrook, L , *Proc R Soc Med* 1926, 19, 31) A simple calculation will show that 2 litres of blood containing 12,000 white cells per c mm given (by the drip method) to a patient with 6 litres of blood should raise the polymorph count from 0 to approximately 2400 In some cases the transfusion may need to be repeated.

I am, Sir, yours faithfully,

LEONARD COLEBROOK

Queen Charlotte's Hospital Isolation Block, Hammersmith, W 6 July 6

THE PROBLEM OF MEDICAL LITERATURE

SIR,—Your correspondents have suggested various remedies for the present chaotic state of the production and distribution of medical literature The production is a special aspect of scientific communication which was vigorously discussed by Sir William Bragg in his presidential address to the Royal Society last autumn I need not discuss here the solutions under consideration As to distribution, Mr Barnard has pointed out the ways in which librarians are already tackling the problem Britain has an unrivalled wealth of medical libraries, but their collections are not coördinated and do not cover the whole field The union list of their periodicals which Mr Barnard is compiling for the Library Association will be an indispensable guide to these collections, and it is to be hoped an incentive to coördinate and complete them.

The scheme of cooperation between certain medical libraries in London, which Mr Barnard also described, has a more immediate purpose May I speak more fully of its aims, and if possible clear up the mis understanding which underlies such criticism as Mr Thornton's, who wrote of the dangers of unofficial coöperation? Coöperation between the libraries of the London School of Hygiene, the Medical Research Council, the Royal College of Surgeons, and University College has been officially approved by the authorities of each institution with the active collaboration of their scientific staffs Our purpose is to begin with this small group of libraries so that our efforts may be practical from the start We hope that other libraries may join us later, including those of societies which serve their own members and not the profession in general

The coöperating librarians will consult one another regularly for the correlation of their activities We mean to attack limited objectives one by one We have begun with the coordination of subscriptions to current periodicals We do not intend to evade duplication where this is required by the scientific workers in each institution, but already in a few months we have cleared up much uneconomic duplication The unwanted periodicals will be discontinued in each library solely to make money available for buying periodicals not yet taken by any of the libraries The working of the scheme depends, as Mr Barnard says, on successful inter library lending But it is essential that it should not be a matter of "librarians persuading their committees," but of close collaboration between librarians and scientific workers

Some of your correspondents have suggested a committee or conference to discuss the problem, is there not need for a wider organisation, a permanent association of medical men and librarians to plan and foster a system of mutual help between all medical libraries? Any schemes for a central library or a central abstracting service must take into account the wealth of medical literature already in the country We who have started this coöperative scheme in London believe that this wealth can be most fully used by correlation of the existing medical libraries, both in collecting the literature and in making it fully accessible through organised service

I am, Sir, yours faithfully,

W R LE FANU, Librarian.

Royal College of Surgeons of England, London, W C 2, July 10

THE NEW ZEALAND POSITION

SIR,—The remarks of your Australasian correspondent on July 1 (p 53) will doubtless call forth a reply in time from New Zealand, but, as one who has just returned from a visit to the Dominion, I feel bound to point out that your readers may get a false impression from what your correspondent writes His contribution is suspiciously like a bit of special pleading for the government and does not give a fair account of what is happening to the profession there

During long negotiations the government rejected the proposals put forward by a unanimous profession The contracts mentioned were for maternity benefit only, the thin end of the wedge The figures given for the doctors' acceptances are correct, but no mention is made of the fact that only a very small minority of the maternity nurses signed their contract

No authentic actuarial report on the social security scheme has been published, although it is alleged that an experienced health insurance actuary was employed. It seems to me that the scheme is top heavy and that the government will be only too glad to blame the doctors if it fails to operate smoothly

I am, Sir, *yours faithfully*,

WM BROWN

Bythorne Galashiels, Selkirkshire, July 8

PROPRIETARY NAMES OR PHARMACOPŒIAL EQUIVALENTS

SIR,—For some time past we have been impressed by the widespread use of proprietary names for certain drugs, particularly in the prescribing of sedatives The following quotation from the recently published "Textbook of Medical Treatment" by Various Authors (Livingstone, 1939) illustrates our contention —

"It is a wise plan to arrange for the patient to have a succession of good nights at the beginning of treatment, by giving a mild hypnotic analgesic (e g *medinal* gr v with aspirin gr x, *luminal* gr iss with aspirin gr x or one of the proprietary preparations such as Lumyrin or Veganin)" (p 731) (Italics ours)

The fact that we are able to quote this example from a book in which great care is taken to give pharmacopœial equivalents wherever possible indicates how well established the habit has become

We feel that in these anxious days this whole question assumes a new urgency in view of the fact that, whether we prefer these proprietary drugs or

not, we may be soon deprived of any possibility of using many of them. In our opinion it would be a valuable service to the profession and to the nation if you could give due prominence to the alternative British or pharmacopœial names for foreign drugs.

We are, Sir, yours faithfully,

T. FERGUSON RODGER,
JOHN D. SUTHERLAND,
SUSANNAH DAVIDSON.

Great Western Road, Glasgow, W 2, July 10

*** For several years we have printed proprietary names with an initial capital letter on their first appearance in any article, and in editorial pronouncements we have preferred to use the pharmacopœial equivalents. We shall increase our efforts to make them more familiar.—ED. L.

PSYCHOTHERAPY BY LAYMEN

SIR,—The published conclusions of the British Medical Association's mental-health committee with regard to the training and recognition of lay psychotherapists were recently considered by the committee of the British branch of the International General Medical Society for Psychotherapy (I.G.M.S.P.), who would like to submit the following comments for consideration

While admitting the present disproportion between patients requiring psychological treatment and those qualified to give it, the solution of this problem by the training of lay psychotherapists is open to the following objections.

1. The proposed lay psychotherapist, unlike other medical ancillaries, will in fact carry out work which is indistinguishable from that undertaken by the medical psychotherapist and consequently must come into direct competition with him.

2. The possibility of relegation of this work to a lay assistant lowers the status of psychotherapy and so of psychological medicine as a whole, with the result that the present endeavours to improve both undergraduate and postgraduate teaching in this subject may be relaxed, to the detriment of medicine as a whole.

3. There are serious practical difficulties in the proposed relationship between the diagnosing physician and the lay therapist which may be fraught with serious danger to the patient.

Psychiatric diagnoses can often only be arrived at in the course of prolonged observation while the patient is undergoing treatment, and it is difficult to see how the lay psychotherapist could be trained in a reasonable space of time to undertake this and at the same time assess the importance of physical factors which so frequently intervene.

4. The important issue at present is to increase the facilities for and adequacy of the training of medical psychologists, since at present there are lamentably few who are really competent to supervise treatment by a lay psychotherapist. The provision of training for the latter may only prove a makeshift policy which will delay the major necessity. Furthermore it seems premature to institute training for the laity when the criteria for medical training for the specialty have not yet been settled

Finally, it is still more important to awaken the public to the importance of adequate prevention and treatment in the mental-health field.

We are, Sir, yours faithfully,

E. B. STRAUSS,
President of the British branch;
H. CRICHTON MILLER,
Vice-president of the Society;
R. HARGREAVES,
Hon. Secretary of the British branch, International General Medical Society for Psychotherapy

July 6

PENSIONS FOR SPINSTERS?

SIR,—As founder and hon. national organiser of the National Spinsters' Pensions Association I would like to make a few comments on your leading article of June 24.

You are quite right in stating that the committee of inquiry did not seem to be able to come to any definite conclusion. Their report has rightly been called a neutral document from which one might read whatever one cared to read, according to one's sympathies or prejudices as the case may be Contrary to your statement that our case failed to survive the cold light thrown upon it by the actuary, we claim that not one of the facts or figures in our "charter" was challenged; the actuaries merely dealt with the case from a different standpoint—in order to complicate it?

I wish also to correct your statement that we deplored our inability to *leave a pension to dependants* We did no such thing, but we do insist that we do not get the same proportionate value for our 5½*d.* contribution as the man receives for his double contribution of 11*d.* A man's contribution of 11d qualifies him for a pension at the age of 65, and also one for his wife on reaching that age. In the event of his death his widow is entitled to a pension of 10*s* (at any age) and his children are eligible for maintenance until school-leaving age For the spinster's contribution of 5½*d.* she can only qualify for a pension for herself at 65 If she dies before reaching 65 nobody belonging to her will receive any benefits; further, if she drops out of insurance before 65—as so many of them do—she loses her pension rights. (All her previous contributions are clear profit to the scheme)

With regard to the "war spinsters," not only our association but all thinking people who have considered the statement of the actuary—that the war did not result in there being a greater number of single women—contend that if by statistics the "war spinsters" can be explained away, then by statistics any other fact can be explained away. There are hundreds of "war spinsters" within our ranks, statistics cannot dispose of them, and you will probably be aware that the press of the country has taken up the cudgels on our behalf with regard to this absurd statement of the actuary.

The report did, however, prove that our grievance with regard to the preferential treatment which is given to the widow is justifiable. It showed that the Government pay a subsidy of 35 per cent. to one section of the widow community, many of whom are young, able-bodied and childless, and 100 per cent. to the pre-act section at 55 years, the age at which the *paying* spinster demands her pension.

With regard to your remark about bath chairs, I should like to ask how is anyone going to subside into a bath-chair on 10*s* a week? I am well aware that at the present time all the nations are looking to the cradles, but surely the wealthiest nation in the world has not yet reached the stage when it must withhold support from its ageing people who have served it so well in the past The women with whom our association is concerned—the ageing working spinsters—have contributed largely to the creation of the vast wealth of this country, which wealth at the present time is enabling us to hold our own amongst the nations of the world. These are the women who replaced the men during the last war, and of whom the war service has taken such a toll of their health.

It is widely known how the spinster has always shown a remarkable spirit of self abnegation in respect of ageing parents and dependant relatives, this spirit has in many cases been responsible for her state of spinsterhood. Even now we are not asking that she be specially compensated for her wealth-creating and domestic services, but that she should have fair consideration along with the rest—that she should receive the same value for her contributions under the national health and pensions acts The committee of inquiry were unable to prove that her grievance was not a genuine one

We are sorry that THE LANCET has entered the ranks of our opponents, but we are happy to be able to state, with authority, that we have many staunch supporters in the medical profession, and in the House of Commons we have Members of Parliament who are supporting us not only as *politicians* but also as medical men

I am, Sir, yours faithfully,

FLORENCE WHITE,
Hon National Organiser, National Spinsters' Pensions Association

21, Scholemoor Lane, Lidget Green, Bradford, Yorks

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M P

ON Friday of last week a thinly attended House of Commons listened to a statement by the Minister of Agriculture, Sir Reginald Dorman Smith, on the milk industry Compared with its predecessor, which was withdrawn in February because of opposition from farmers and distributors, the Government's present bill may be described as one having the milk left out and the subsidy left in But it is unfortunately worse than that The original bill provided for the setting up of a milk commission "to keep generally under review matters relating to the milk industry" and to advise and assist the Ministers It created a constitution and a living brain for the milk industry, made provision for pasteurisation, and allowed for expenditure on research and education But all this has gone

The Minister began with an excuse when he said that since the withdrawal of the earlier bill it was "not now possible to introduce this session any fresh proposals which can even purport to be called comprehensive" Yet, as he said, the industry is one of outstanding importance More than 150,000 farmers are engaged in dairy-farming and the annual output of milk and milk products is valued at more than £60,000,000, or about a quarter of the total value of agricultural output The debate showed clearly that the purpose of this bill is to carry over the present unsatisfactory arrangements for milk-supply for a further period, but no new proposals are made and the vital problems of safe milk and of cheap milk are left in the air Clause 2 gives powers to the Minister to make grants for cheap milk for school children, expectant and nursing mothers and children under five, but there is considerable doubt as to how much milk will reach those for whom it is intended Not a penny of the £250,000 voted last year for this purpose has yet been spent, and members not unnaturally asked what is the use of voting money for benevolent sounding schemes if they are not put into operation Another feature of the bill—one becoming common in connexion with subsidies—is that payments are to be made retrospectively as from Oct 1, 1938, but as Dr Haden Guest remarked, milk cannot be given retrospectively to the expectant and nursing mothers and children under five whom Parliament in July, 1938, intended to benefit

The bombshell of the debate was left to the end when the Under Secretary for Scotland, Mr Wedderburn, in his reply left out all reference to future Government policy on pasteurisation In reply to a question by Mr A V Alexander he announced that the Government would do nothing, but recommended that local authorities—Glasgow was mentioned—should promote their own bills to secure powers in their own areas The Government last year asked local authorities *not* to promote bills of their *own* Now they have reversed that policy and ask them to do so if they wish Sir Francis Fremantle was not alone in feeling disturbed at this proposal to "pass the buck" to the local authorities The question that was in most members' minds was, "ought there not to be some definite protection for the community against disease?" And so the debate ended on a note which, as one agricultural member emphasises from time to time, was "thoroughly unsatisfactory"

FROM THE PRESS GALLERY

Milk Policy

IN the House of Commons on July 7 Sir R DORMAN-SMITH, Minister of Agriculture, moved the second reading of the Milk Industry (No 2) Bill Since the former bill was withdrawn it had been necessary, he said, to re-examine the whole problem of milk policy It was not now possible to introduce *proposals* which could even purport to be called comprehensive Certainly the fitness and health of the nation would be improved by a greater consumption of milk The Advisory Committee on Nutrition had recommended a pint a day as the desirable ration to aim at, whereas at present the average was less than half a pint But the nation was becoming more milk-conscious, he paid a tribute to what the teachers had done in connection with the *milk-in-schools* scheme As a result the number of children taking milk in schools in England and Wales had gone up from 900,000 to well over 3,000,000 and the number was still increasing In the last milk contract year the increase in the consumption of liquid milk was estimated at about 35,000,000 gallons net in England and Wales As a result of the scheme for the *encouragement of the* production of clean milk at the present time over 40 per cent of the total milk sales were now of at least "accredited" standard Government assistance had also been directed towards the eradication of tuberculosis in cattle

The existing milk legislation was due to expire on Sept 30 next and the purpose of the present bill was to carry on to the end of September, 1940, the activities which had already been started The *measure had three main objects* The first was the encouragement of quality-milk production by the provision of Exchequer *contributions towards* the cost of premiums paid on *quality milks by milk-marketing boards* The second was to provide Exchequer assistance for the milk *in-schools scheme* and for the supply of milk at reduced prices to mothers and young children The third was to put a *bottom into* the market for milk sold for manufacture into butter and cheese The estimated cost to the Exchequer of these proposals was for the current milk year about £1,000,000 and for the next milk year about £2,200,000, in addition to the expenditure (£300,000 and £500,000) under the Agriculture Act in respect of milk from attested herds.

It was the intention to arrange for the supply of milk at reduced prices to local authorities so that they might undertake extensions of their existing schemes for the supply of milk either free or at reduced prices to nursing and expectant mothers and children under five. Already a scheme along these lines had been submitted by the main Scottish milk-marketing board for its area and had been approved. A similar scheme was now under consideration for England. In view of the increased consumption of milk in schools—and he desired to go on increasing that—and the proposed maternity-and-child-welfare cheap-milk schemes the bill did not provide for any overriding limit to the annual grants The Exchequer grant for the coming year would be about £1,000,000, as compared with £500,000 a year hitherto, and about £800,000 for this year.

Mr. T. WILLIAMS, on behalf of the Labour Party, expressed approval of the subsidies for quality milk and for cheap milk-supplies for children and nursing and expectant mothers. They also entirely agreed with the continuance of the milk-in-schools scheme, for with milk at its present price it was impossible for millions of families to purchase the milk they required to keep healthy. But in view of the fact that 40 per cent. of herds reacted to the tuberculin test something more needed to be done. The government had set up a national veterinary service, but there were only 22 veterinary surgeons for the whole of the country, and he urged a much bolder programme of disease eradication and more research; but above all they needed better and cleaner farm buildings.

Mr. W. ROBERTS said the government had run away from the much bigger problem they might have tackled.

Dr HADEN GUEST said that on health grounds nothing could take the place of milk; the present consumption was definitely below what it ought to be, especially among the poorest classes of the population. Under the Milk (Extension and Amendment) Act, 1938, £250,000 was set aside for the supply of milk to nursing mothers and children under five, but up to March 30 of this year none of it had been spent because the Minister had not been able to come to an agreement with the producers and distributors. Payments for milk were under the present bill made retrospective to 1938, but milk could not be given restrospectively to nursing mothers or children under five. He thought the Government were paltering with this question. The farmer got a very low price for his milk while the distributor got a very high price. The farmer should get a better price and the consumer should get his milk at a lower price. At present we had a policy of restricted production and restricted consumption and prices here were higher than in any European country, and higher than in many parts of America. He realised the difficulties of the Government, but it was surely time to put the organisation of the milk industry on an economical footing. The important thing was nutrition and health, and putting a child's needs at a pint a day at least a quarter of the children in the country were getting only one-fifth of the milk they needed. One generation of scientific nutrition and farming policy for the nation would transform the generation on which they were acting.

After further debate the bill was read a second time.

Later, on a money resolution, Dr. HADEN GUEST urged that there ought to be a guarantee that the milk that was to be sold was of a sufficiently high quality not to cause disease. The amount of tuberculous milk sold was a menace to the health of the community.

Sir R. DORMAN-SMITH said the Government wanted to encourage the improvement of milk They were getting on with the eradication of tuberculosis It was not everybody's opinion that pasteurisation was either necessary or desirable. Consumers if they desired pasteurised milk should be able to buy it. It was open for any local authority to present a bill.

Mr. ALEXANDER said he was wholly disappointed with the method of the Government in announcing their policy in this matter. They now found that the agricultural side of the Government at any rate was taking the side of those opposed to pasteurisation and leaving it to the initiative of local authorities to promote legislation. That was a retrograde step.

Brigadier-General BROWN said it was better policy to remove the disease from the herds than to take it out of the milk by machinery.

Sir FRANCIS FREMANTLE said that medical men had been careful to recognise the difficulties of the Government. Agriculturists should realise when they were calling for publicity in order to get the industry back to prosperity that their chief agents were medical men. The medical profession were practically unanimous that milk could be rendered safe. He hoped it would not be left to each local authority to introduce safeguards as to pasteurisation.

Sir R. DORMAN-SMITH said the whole question of milk policy was under consideration with a view to the introduction of legislation at a later date He could not say what the policy about pasteurisation would be.

Scottish Health Services

In introducing the vote for the Department of Health for Scotland in the House of Commons, Colonel COLVILLE, secretary of state for Scotland, gave an account (reported last week) of the contribution the department had made and was making to the health and well-being of the people.

Mr. T. JOHNSTON, speaking for the Labour Party, admitted that great improvements had been made in the physical condition of the people, but urged that the figures for Scotland were disquieting when compared with those for England and Wales They showed 417,000 cases of sickness and incapacity in Scotland in the course of the year and 31,000 of the insured population were out of work for a whole year because of sickness. There must, he said, be a tremendous amount of avoidable sickness and suffering among old-age pensioners.

Sir ARCHIBALD SINCLAIR, for the Liberal Party, agreed that there was much leeway to make up. Infantile mortality in Scotland was still 70 per 1000 as compared with 53 in England and Wales, and the other death-rates still compared unfavourably with those of England. He was glad the estimate for the Highlands and Islands medical service was being raised by £10,000, but that was not enough. One of the worst aspects of the health of school-children in Scotland was the condition of their teeth. Some 56 per cent of the school-children had from one to four teeth decayed Bad nutrition and bad housing were also causes of ill health which needed more attention.

Mrs. HARDIE pleaded for the establishment of clinics for rheumatism.

Mr. HENDERSON STEWART said that it was baffling to him to find that Scotland lagged behind in the race for health and better housing. He could only explain it by assuming that the Secretary of State was so overburdened that he had not the time necessary to think of the big problem of Scotland.

UNDER-SECRETARY'S REPLY

Mr. WEDDERBURN replying to points raised said that properly coordinated plans existed for the organisation of a casualty-hospital service in Scotland in the event of war. The Minister of Health and the Secretary of State for Scotland proposed, at a very early date, to lay before Parliament a white-paper which would give a comprehensive statement of the arrangements made in Scotland as well as in England. The Scottish Secretary would also, at the beginning of next week, issue to all hospitals in Scotland which would take an integral part in the emergency hospital service a statement showing the particular rôle they would be expected to play, and which would also state the approximate numbers of beds which they would be expected to set free for

casualties, the ways in which it was contemplated that these beds would be freed, the probable number of patients to be sent home and the number to be transferred to the institutions to which patients would be transferred from the hospitals With regard to the Highlands and Islands, the Secretary of State had never felt justified in asking for the annual sum proposed in the report on the Health Services for last year, but increases had been obtained for a fairly large number of small objects, and the amount of grant payable this year showed an increase of £10,000 on the corresponding figure for last year, having risen from £90,000 to £100,000. With regard to dental services, the department's medical officer was at present engaged in making a survey of the school dental conditions throughout the whole of Scotland, with a view to making recommendations for the improvement of these services

QUESTION TIME

JULY 6–12

Cheap Milk in Scotland

Mr MATHERS asked the Secretary of State for Scotland how much of the Exchequer subsidy voted under the Milk (Extension and Amendment) Act, 1938, was being used to help maternity and child welfare authorities to start cheap milk schemes, and the price charged to the local authorities for the milk, how many authorities had inaugurated such schemes, and their names, how many expectant and nursing mothers were receiving milk free and for payment, and the price in the latter case, and how much milk was normally given daily in each case, and for what period —Mr COLVILLE replied A sum of £16,050 has been provided in the estimates of the Department of Agriculture for Scotland for the current year in connexion with the sale of liquid milk at a reduced price to local authorities in Scotland for the purpose of their maternity and child welfare arrangements A scheme by the Scottish milk marketing board was approved on Feb 6, 1939 Local authorities within the board's area can obtain supplies at 8*d* per gallon for ordinary milk or 9½*d* per gallon for tuberculin tested milk, plus the cost of distribution Arrangements by Glasgow corporation under the scheme have been approved and proposals by six other authorities (the county councils of Dunbarton, Selkirk and Stirling and the town councils of Dumbarton, Dunfermline and Stirling) have been received and are under consideration The arrangements provide that, normally, one pint of milk will be supplied daily, either free or at a price not exceeding 2*d* to expectant or nursing mothers and to children under five years of age where the family income is within a scale adopted by the local authority and approved for the purposes of the scheme So long as the applicant continues to be qualified there will be no limit to the period during which a supply of one pint daily may be given The Glasgow arrangements came into operation only on July 1 and information as to the number of participants is not yet available

Fresh Milk in Schools

Mr DUNN asked the parliamentary secretary to the Board of Education how many schools, elementary or secondary, there were where fresh milk was not available for the children in England and Wales, and if he would say what was the reason for this and what he proposed to do to correct it —Mr KENNETH LINDSAY replied The number of public elementary school departments in England and Wales in which it is known that milk was not available in any form on March 31 last was 1574 out of a total of over 29,000 There were also certain other departments, the number of which it has not been possible to ascertain in the short time available, in which only dried milk was provided On the same date there were 132 grant-earning secondary schools in which no liquid milk was available The principal reasons for the failure to provide liquid milk are the difficulty of finding a supplier for small and remote rural schools, the inability of the medical officer of health to approve as safe the only milk available, and in a small minority of cases the unwillingness of the teachers to operate the scheme An analysis of all these cases is being made with a view to ascertaining the reason in each case

Mr. DUNN Is this due in any degree to the operations of the Milk Marketing Board?— Mr LINDSAY I do not think so In so far as the small rural schools are concerned we are now engaged with the Milk Marketing Board in trying to overcome this difficulty If I explained the matter at greater length I could show that there are many other factors which enter into the question

Milk for Mothers

Mr BROOKE asked the Minister of Agriculture what percentages of the persons eligible were participating in each of the existing special area schemes for the supply of milk at a reduced price to nursing and expectant mothers and children under school age, and whether the price per pint was the same in each case —Sir WALTER WOMERSLEY replied My right hon. friend is informed by the Milk Marketing Board that, of the persons eligible to participate in the experimental schemes for the supply of milk at reduced prices to nursing and expectant mothers and children in the special areas, the proportions that have availed themselves of the facilities are 60 per cent in Jarrow, 61 per cent in Rhondda and Walker-on Tyne, and 65 per cent in Whitehaven The milk is supplied at 2*d* a pint, but in Whitehaven a special grant is made from the funds of the Whitehaven Council of Social Service and the Cumberland Friends' Unemployment Committee to enable certain applicants to be supplied with the milk at 1½*d* a pint

Maternity Hospital Accommodation

Mr GORDON MACDONALD asked the Minister of Health what hospital accommodation for maternity cases existed in the Lancashire county council area, giving separate figures for the Wigan county area, whether he was satisfied that such provision was adequate to meet requirements, and, if not, what action he proposed to take to increase such accommodation to the necessary extent — Mr ELLIOT replied Maternity accommodation in the county council's area is available at forty-six voluntary and municipal institutions This provision appears to be generally adequate, but further accommodation is desirable in some particular districts Five extension schemes are already contemplated In the Wigan area, where seven beds are available at Billinge Infirmary, the need for extension is realised and is under joint consideration by the county and county borough councils I am keeping the position under review

London Maternity Services

Mr DUNCAN asked (1) whether he was now prepared to give an emergency grant to the London voluntary maternity hospitals to enable them to tide over the difficulties which had arisen as a result of the passing of the Midwives Act, and in consequence of the new rules of the Central Midwives Board, and (2) if he was now in a position to give a reply to the points raised by a deputation representing the London Maternity Services Joint Committee, which interviewed him on April 19 last —Mr ELLIOT replied The question of grants to training institutions is receiving consideration in connexion with the recommendations of the Interdepartmental Committee on Nursing Services, but I am not yet in a position to make a statement

Foster Mothers

Dr SUMMERSKILL asked whether he was aware that women who were totally unfitted, either from advanced age, ill health, or lack of morals, were able to take foster children provided notice was given to a local authority, and whether he proposed to take any action in the matter — Mr ELLIOT replied I would draw the hon member's attention to section 212 of the Public Health Act, 1936, under which the welfare authority have power to apply to a court of summary jurisdiction for an order to be made for the removal to a place of safety of a foster child [illegible] to be received by a person who, for such reasons as are stated in the question, is unfit to have the care of the child The notice which under the act is required to be given to the welfare authority before a foster child is received for reward should afford the welfare authority

opportunity for action to prevent the reception of foster children by unsuitable women.

Black-listed Elementary Schools

Mr. DUNN asked the parliamentary secretary to the Board of Education how many elementary schools were still on the black list, and how many were provided or non-provided schools.—Mr. LINDSAY replied: The number of public elementary schools still on the board's list of schools with defective premises is 797 of which 225 are provided schools and 572 non-provided schools.

Replying to a further question by Mr. Dunn, Mr. LINDSAY said that a great variety of steps was being taken to correct the position. The main reason for the existence of defective schools at present was the failure to complete the reorganisation, and the only answer to that was to press on with reorganisation. In the case of schools which could be slightly altered, where reorganisation would not affect the problem, the answer was to do away with the obvious difficulties, and that work was being proceeded with.

Medical Education in West Africa

Mr. SORENSEN asked the Secretary of State for the Colonies whether, with a view to the more rapid development of an African medical service, he would make an inquiry into the possibility of creating a medical school in West Africa.—Mr. MALCOLM MACDONALD replied: A school of medicine has been established in Nigeria for a number of years and is making good progress. The whole question of the future development of higher education, including medical education, in West Africa is to be discussed at the conference of West African governors which is to be held in August.

OBITUARY

HENRY HAVELOCK ELLIS

L.S.A., F.R.C.P.

THE nineteenth century is often regarded as an age of unquestioning and self-satisfied complacency. This is not the whole truth, but it accounts for the battles that had to be fought by those original spirits who challenged the confident opinions of the majority. Among the foremost of these disturbers of tradition was Henry Havelock Ellis, who died last Saturday in London at the age of 80.

[Lafayette

Born a few months before the publication of the "Origin of Species," Havelock Ellis grew up in surroundings where sex was regarded as something shameful and *apart from* ordinary life. Its mention was scarcely permitted, and as the obverse *to this reticence* there existed an underworld which Havelock Ellis himself described in his own private diary at the age of 15, after an appreciation of the artistic merits of the statue of the nude Lesbia at Milan:

"But it is the form and the anatomy which principally struck me for their truth and naturalness. I will not specify instances of this because in our present fastidious and decorous age it would be considered a most indecent breach of propriety. Why so, I know not; perhaps I might be told that it would corrupt youth. Though how that can be I know not when it is that same youth who gloats and revels in that which in his hands is transformed into filthiness. Oh! the vistas of disgusting filthiness in a schoolboy's mind which is ever creeping out of his mouth; which he scribbles everywhere, which he must commit to paper, which he must turn into filthy doggerel."*

It is clear that at that early age Havelock Ellis already had that impulse to examine and challenge accepted beliefs which dooms its owner to a struggle against one of our strongest social forces.

A few words about his upbringing may illustrate, if they do not explain, this habit of mind. Ellis came of East Anglian stock. The son of a seaman he spent his youth largely at sea, crossing the Pacific. His education was sporadic and discontinuous and his home life, although affectionate and intimate, was lived in circumstances which enabled him afterwards to say that absence makes conjugal hearts grow fonder. At the age of 16 he found himself in New South Wales teaching in remote schools, writing poetry, reading Shelley and James Hinton, and becoming convinced of the basic identity of science and mysticism which remained his creed. The inner story of these days remains to be revealed, but he might have become another Edward Carpenter had he not made up his mind that a study of medicine was essential to him in clearing up the problems of sex. After four years he returned to London and studied at St Thomas's where he qualified in 1889 at the age of 30. He practised medicine only for a few months and two years later he met Edith Mary Lees who shared his work for 25 years and was herself an essayist and novelist. Even in student days his output of literary work was extensive and varied; he then edited the Mermaid series of "Old Dramatists" and planned the "Contemporary Science Series" which ran usefully until 1914. In the year he qualified appeared "The New Spirit," the first serious challenge to complacency. It was almost universally condemned by reviewers and the reaction was a foretaste of the storm which burst in 1898 over the first volume of "Studies in the Psychology of Sex." One Bedborough, who had sold a few copies of the book, appeared at the Central Criminal Court; by pleading guilty he escaped punishment himself and prevented the presentation of a defence against the indictment which ran thus:

"a certain lewd, wicked, bawdy, scandalous, and obscene libel, in the form of a book entitled 'Studies in the Psychology of Sex: Vol I. Sexual Inversion, by Havelock Ellis,' in which said book are contained among other things, divers wicked, lewd, impure, scandalous and obscene libels, and matters, which said book is, pursuant to the provisions in that behalf, of the Law of Libel Amendment Act, 1888, deposited with this indictment, . . ."

This description of the book expressed the spirit of the times and provides us with a measure of our change of outlook when we compare it with the respect now shown to the memory of Havelock Ellis. Perhaps we are too close to it to consider

* Quoted from Houston Peterson's Havelock Ellis, Philosopher of Love, London, 1928, p. 28

impartially the advantages and disadvantages of our altered outlook Of young people today of both sexes many can discuss and face frankly the problems and difficulties that must in any civilised community arise in connexion with the instinct of sex, which is at the same time powerful and in need of reasoned control The picture that the young Havelock Ellis drew of the filthiness in the school boy's mind is, we may hope, no longer so true There is, we know, more open laxity in sex behaviour than there was 30 years ago, though the influence of the last war had its effect in producing that Perhaps we owe something to Havelock Ellis for our modern courage in openly attacking the incidence of venereal disease He has taught us that the sexual perversions can now be approached, by some of us at least, as problems to be understood and not as examples of wilful depravity, homosexuality is recognised as a condition which, like normal sexuality, may occur in the best and worst of mankind and should be handled in the light of that knowledge

Havelock Ellis himself was shy and retiring he never appeared in public, never lectured, and, strange to say, rarely engaged in controversy except so far as he ably defended his views when presenting them in the written word. The example he gave of the calm pursuit of unpopular truth stands out in a world where the power of reason is becoming more and more stultified by appeals to the emotions of the herd. These qualities could not fail to impress

"In some half dozen conversations held in the course of the last fifteen years," writes C P B, "two of Havelock Ellis's characteristics impressed themselves upon me The first was his generosity to writers on subjects within his special field Since the war there has been a spate of books on the sexual question The bulk of them contained little that was new, they consisted, for the most part, of second hand versions of Ellis's ideas presented with little of his literary distinction and none of his philosophical detachment Yet to the authors of these books he gave nothing but sympathy and encouragement, if criticisms were offered, they were couched in the politest of language It was agreeable to find a great pioneer so completely devoid of petty jealousies The second was his uncompromising refusal to allow himself to be honised Many were the organisations which sought to honour him, their invitations were always met with a gentle yet firm refusal

"The range of Havelock Ellis's culture, though prodigious, is never oppressive, his writings bear the imprint of an acute yet meditative intelligence His mind was delicately attuned to the rhythm and beauty of words, and he combined a quick sympathy for human beings with a philosophical detachment His integrity and courage—a quality much called for by the hostility which his early writings provoked—sprang from his essential generosity, and from the mystical cast of his mind was derived his indifference to the outward marks of human esteem, his fundamental modesty and humility"

SYDNEY BACKHOUSE HULKE

FRCS

THE death of Dr Hulke on June 10 at the age of 68 has removed a popular figure in the medical life of East Kent He was the tenth link in a chain of doctors whose name is closely associated with Deal, where the Hulke family has practised since it was driven from the Low Countries by the Duke of Alva He was in partnership with his brother and his nephew, both of whom predeceased him Sydney Hulke was naturally a Middlesex man and following his famous uncle, John Whitaker Hulke, he took an early interest in the military side of surgery and after a period as surgical registrar he served in the South African war From 1914 to 1918 he worked indefatigably in three hospitals at Deal and Walmer "Hulke," writes FRCS, "fulfilled one's ideal of the best type of British practitioners Nature had gifted him with a fine physique, courage and sympathy, and these were used devotedly in the service of those who sought his professional aid. His temper could not be ruffled —he was never known to be discourteous, and the affection and esteem of all classes was shown by the enormous gathering of rich and poor at his graveside The Hulke tradition is still handed on his married daughter, Muriel Brander, is a fellow of the college"

DAVID MACMILLAN

M D EDIN

A YEAR after his retirement Dr Macmillan died on July 6 at Tunbridge Wells He was a native of Kirkcudbrightshire, being born in 1867 at Chapel and educated at Ewart High School, Newton Stewart, in the neighbouring county of Wigtown Thence he proceeded to Edinburgh University where after taking a degree in arts he graduated in medicine in 1891 In 1897, after a short period of assistantship in Farnworth, Lancashire, he went to Prestwich, Manchester, to join the late Dr Leslie Jones in practice and he remained there for the rest of his working life One who knew him intimately for many of these years writes of the way in which he endeared himself to all with whom he came in contact, and of his loyalty as a colleague "He was a shrewd and kindly counsellor, indefatigable in his efforts to help, always activated by the highest traditions and ever scornful and intolerant of anything that, as we say in Lancashire, was not 'jannock' In his busy life he had little time to cultivate hobbies, but when opportunity offered was very fond of a game of golf or bridge, both of which practices he told me he hoped to indulge in his retirement, so well deserved"

Dr Macmillan leaves a widow, two sons and two daughters

FOOTWEAR AND FITNESS —At a meeting of the National Fitness Council for England and Wales, held in London on July 10, Lord Dawson said that the medical committee of which he is chairman is inquiring into the manufacture of suitable footwear for all classes of the community Sir Kaye Le Fleming announced that a publication is to be issued giving simple rules for the acquisition and maintenance of personal health

THE DIXON MEMORIAL HALL, DUBLIN —The hall erected in Trinity College in memory of the late Andrew Francis Dixon, professor of anatomy and chirurgery in the University of Dublin was publicly opened by Dr W E Thrift, provost of the college, on July 3, in the presence of a large number of friends and former pupils of the late Prof Dixon The hall, which was built from the designs and under the supervision of Mr F G Hicks architect, will be used for meetings and examinations in connexion with the school of physic Dr T G Moorhead regius professor of physic, gave a brief address in commemoration of Dixon's work and personality, and appreciations were added by Prof J K Jamieson, Dixon's successor in the chair of anatomy, and by the provost The funds for building the hall were got by public subscriptions amounting to some £2300 with the addition of a larger amount contributed by the Board of Trinity College

MEDICAL NEWS

University of Cambridge

Dr. A. M Jones and Dr R E Kenny have been elected to Elmore medical research studentships

The title of the degrees of M B , B.Chir. has been conferred on Gwendolen M. Allen-Williams (Newnham).

University of London

Prof Frank Horton, F.R.S , professor of physics in the university, at Royal Holloway College, and a member of the senate since 1925, has been elected vice-chancellor for the year 1939–40 Lord Dawson, who has hitherto been a representative of the faculty of medicine on the senate, has been appointed as a coöpted member in place of the late Sir Frank Dyson.

Mr Harry Stobie, M.R C S , has been appointed to the university chair of dental surgery and pathology tenable at the Royal Dental Hospital of London school of dental surgery.

Mr Stobie, who is 56, studied at the Royal Dental Hospital and at St Thomas's Hospital He qualified L D S in 1910 and for some time held the post of clinical assistant in the dental department at St Thomas's Hospital After taking his M.R.C S. in 1911 he returned to the Royal Dental Hospital as demonstrator in operative dental surgery and tutor in dental anatomy and dental surgery. During the war he served with the R.A M C as officer in charge of division V and surgeon-specialist at the Croydon War Hospital for Injuries of Jaws. In 1915 he became hon. assistant dental surgeon at the Royal Dental Hospital and in 1930 he was appointed to his present part-time posts of hon dental surgeon, dean and director of teaching, and lecturer in dental surgery and pathology at the hospital. From 1932 to 1936 he also held the post of postgraduate instructor in oral surgery at the hospital He is a member of the board of examiners in dental surgery of the Royal College of Surgeons of England and has also examined for the universities of Bristol and Birmingham In 1935 Mr Stobie attended the International Stomatological Congress at Bologna as representative of the Government, and he recently went at the invitation of the Egyptian government to inspect and report on the dental school at Cairo

At recent examinations the following candidates were successful :—

D P H

T. K Abbott (not eligible to receive the diploma until December, 1939), Rosetta C Barker, Lily Bennett, Margaret Brodigan, H B C Carter-Locke, John Clark, C S Davies, D O. Dickie, Jean Duncan Whyte, R. W Elliott, C N Faith, Margaret A B Fleming, May E M Fleming, J F Houlihan, E. C H Huddy, J H Lawrence, H A Leggett, V. N Leyshon, F. D M Livingstone, Jean J Macdonald, J. P. McGladdery, R W. Markham, Isobel M. S Marshall, T. G Martin, E L M. Millar, Anil Mukerji, Dorothea M Norman-Jones, M. N Pal, Peter Pan, M M. Sircar, G R Taylor, R C Wofinden, Grace E. Woods, and Rowena Woolf

DIPLOMA IN BACTERIOLOGY

H. L Carruthers, W. J Godden, D F Gray, G. J. G King, Ian MacKay, C D Parker, *M T. Parker, Y. S Rao, Marion Ross, and L B E Seneviratne

* With distinction.

University of Aberdeen

On July 6 the honorary degree of LL D was conferred on Mr. Cyril Burt, D Sc , professor of psychology in the University of London, and Dr. Alexander Low, professor of anatomy in the university from 1925 to 1938 The following degrees and diplomas were also conferred :—

M D—*J D MacLennan, †A. B Christie, †A. M. Ramsay, J. C Niven (in absentia), and R. W H Welsh

* Awarded highest honours for thesis
† Awarded commendation for thesis

M.B , Ch B—Robert Semple (with first-class honours); Alison B Cruickshank, J. I Rice, R. L Richards, and G S. Riddell (with second-class honours), James Abernethy, L H Allan, Jessie E C Baird, J E A Bartlet, K M Bell, C A Brown, P L Brunnen, W N. Calder, I W Caldwell, W D Catto, George Cormack, D A Craib, Phyllis E. Davidson, Stewart Duff, John Duguid, Jean A Ferguson, Marian M. Fergusson Alice D Findlay, H. R Findlay, R J A Fraser, Rose M. Fraser, L D. M. Gavin, Helen W Geddes, S M Gill, J. S Hamilton, N G C. Hendry, J A. Houston Alexander Hunter, A S Jessamine, Charles Low, Douglas McBain, A. D McGill, J K. Mackay, I A R Mackenzie, Margaret R McKenzie, Malcolm MacLeod, Anne M S Macrae, N. H Mackworth, R G Main, Eric Milne, W S. Milne, John Morrison, C. F. Murison, Janet B Patterson, I D Pennie, J. W Rae, J B Raffan, Mary H. Reid, D H. Rhind, John Scorgie, L T Shennan, G M. C Smith, Helen A Smith, D L Stewart, J. C Taylor, Elizabeth M. F. Tolmie, Sheena M Tosh, Jean C Twort, and P. H R Williams

D.P H—Ann L Shennan (with credit), David Barclay, C E Gorrod, J. J. T. Morrison, J. B. Petrie, G L Ritchie, C. J. Silver, and J. M. Thomson.

Royal College of Surgeons of England

Election to the council—On July 6 three fellows were elected into the council to fill the vacancies caused by the retirement of Prof G E Gask and Sir James Walton and by the death of Prof Graham Simpson. The result of the poll was as follows :—

	Votes
Sir JAMES WALTON (London)	585
CECIL AUGUSTUS JOLL (Royal Free)	518
ROBERT JOSEPH WILLAN (Newcastle)	448
Robert John McNeill Love (Royal Northern)	414
Reginald Martin Vick (St Bart's)	351
Robert Davies-Colley (Guy's)	342
Vincent Zachary Cope (St Mary's)	275
Lennox Ross Broster (Charing Cross)	240
Ralph St Leger Brockman (Sheffield)	198
Sir Lancelot Barrington-Ward (Great Ormond Street)	195
James Ernest Helme Roberts (St Bart's)	191
John Bowman Hunter (King's College Hospital)	165
Julian Taylor (University College Hospital)	164
William Hugh Cowie Romanis (St Thomas's)	156

In all 1669 fellows voted , in addition 17 votes were found to be invalid, and 2 votes arrived too late. Sir James Walton, Mr. Joll and Mr. Willan are all elected for the full period of eight years

University of Manchester

At recent examinations the following candidates were successful :—

M D

Simon Almond, C G Eastwood (with commendation), Evelyn M. Holmes, A. E Martin (gold medal), C S Parker, H T. Simmons, and Colin Starkie

FINAL EXAMINATION FOR M B , CH B

Part II—A D. Leigh and M. D. Milne (with first-class honours), Mary Fleure and A. F. Williams (with second-class honours), G T Ashley, T. G Barlow, Irene M Bower, T M Brand, Frances M Bullough, W. W Burnett, T. E A. Carr, G. R. Crawshaw, Olive I Elkin, R T. Grime, Joan Halstead, Cyril Hamwee, C P Heywood, Hannah Horton, W L R Kenyon, Joseph Latham, Joyce Leach, R A. Martin, A P Massie, Asa Mills, M. J. Parsonage, J. R Platt, T H Redfern, Edward Ridehalgh, Benjamin Roditi, E. S Rogers, M S Rowley, L D Rutter, J. E. Schofield, Barbara M Statham, F. W. Taylor, M R. Tomlinson, G. K. Tutton, and R. M Winston

Part I—Arnold Ashworth, J. H. R Barker, F R Brebner-Smith, Thomas Brittain, Gerald Caplan, Rachel Claiman, Hilary J Crewe, J G Ferguson, E S Frazer, R J Gampell, James Gregory, Hilda R Harris, Harold Hassall, Stanley Haythornthwaite, Irene E Howorth, Margaret Jacques, Oscar Janus, P W. Kippax, J T A. Lloyd, J L. MacLean, William Mellor, Elsie L Mettam, Catherine E D. Nash, Christopher Parish, K C Prausnitz, T F. Redman, Frank Robinson, Margaret H Roscoe, J C Seddon, G. K Spruell, J K Steward, T. A. Taylor, Edith M Thorp, A L Tulk, Ena M. Walmsley, and Joyce Worthington

D P H.

Part II,—Randle Bennett, Caroline J Chalmers, William Fielding, G. M. Fleming, D. M MacKechnie, H. D. B. North, R M Shaw, G R Walker, and A B White

Part I—S G. Abelson, D H. Anderson, H S Bagshaw, Caroline J Chalmers, J R Davidson, William Fielding, G. M. Fleming, Neil Maclean, H N Osborne, Morris Pivawer, R. M Shaw, Fred Stratton, and A B White

University of Dublin

On June 28 the following degrees were conferred :—

M.D.—J E Gillespie

M B., B Ch , B A O—R S W. Baker, H S Boyce, W. F. Carpenter, A C Corbett, J K Craig, Edward Cullen, Matthew Daly, Jack Freedman, S M Freedman, Leslie Fridjohn, Arthur Graham, J P Gore-Grimes, Sylvia M Hall, G. H Henry, Myer Herman, E G Hobart, D W McCarthy, Noel McSharry, L. E. Morris, C B Robinson, C H Rutherford, G S Sheill, W. B Wolphy, J D Whiteside, Frank de Burgh Whyte, V. T. Williams, and F L Willington

B Dent Sc—C J Dugdale and R D Jones.

At recent examinations at the school of physic, Trinity College, the following candidates were successful :—

M D

Marjorie R E Boyd, J E Gillespie, H B Sutton, and H B Wright

FINAL EXAMINATION FOR M B , B CH , AND B A O

Therapeutics and pathology—Maude F P Bigger (first-class honours) G S Prince, W G D Caldwell, and G B Gibson (second-class honours), Kathleen M J Morphy, Helen S Watson, B W Wyllie, J R Hassard, D W Montgomery, C E Williams Ivy K Bayne, Ethna M MacCarthy, J N Greene, E D Khan, A F Crowley, A G Lee, Margaret F Y Dixon, Alicia G Pike, H H Robinson, T J N Bates, J D Dennehy, A R B Jackson, J B Dunlop, and G F Shaw

Medicine—J D Whiteside, David Selman, F L Willington, C B Robinson, G F N Anderson, Sylvia M Hall, Muriel

Bannister, J K Craig, L E Morris, and C W Bradfield (second-class honours), E Lucas M E FitzGerald, Samuel Fine, W L Bamford, J O G Moore R G P Heard, Matthew Daly, A H Isaacson, G S Sheill Kathleen Dowling, B S Good Olive S H Devlin, T N Arthur N J Hogan, Tom Shier, Matthew Shreider, Jack Freedman, Arthur Graham, W F Carpenter, D W McCarthy, A C Corbett, E F Keating, N G Brown, G H Rutherford, G A Anderson, D L Harbinson, Frances M C Wolfe, and G E P Kelly

Surgery—C B Robinson, Sylvia M Hall, R S W Baker, and F L Willington (second-class honours); P M Goedvolk, J K Craig, H D Chomse, J D Whiteside, A O Corbett, J P Gore Grimes, E G Hobart, F A Hanna, Frank deBurgh Whyte, M Waters, Myer Herman, W B Welply, W F Carpenter, Maureen C Johnston, Arthur Graham Matthew Daly, L E Morris, Edward Cullen, H S Boyce, and D W McCarthy

Midwifery—H H Balch and J R Healy (second-class honours), William Jones K T Acton, P C Denham, R W Carey, E G Millar T H Downes, Moira M Mallagh, F J Queally, M N O Riordan, Phoebina Eakins, and R M Hallahan

DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS

R. A Fairley, W F Joynt, and H M Ayoub (second class honours), and M A Abed

D P H

Part I.—T S Agnew

Part II—J O Gaffney (first class honours), J G Cunningham (second class honours), and S H Morrison

D P M

Part I—J N P Moore (first class honours)

The Dr Henry Hutchinson Stewart scholarship in mental diseases has been awarded to Dr J N P Moore, the De Renzy centenary prize to Dr J C Gaffney, and the Butterworth prize to Dr F L Willington

College of Physicians of Philadelphia

The Alvarenga prize of the college has been awarded to Dr Harry Goldblatt, professor of experimental pathology and associate director of the institute of pathology of the school of medicine, Western Reserve University, Cleveland, Ohio, for his contributions to the pathogenesis of hypertension The prize is awarded to the author of the best memorial upon any branch of medicine

Society for Relief of Widows and Orphans of Medical Men

At a quarterly court of directors held on July 12, Dr C R Kempster, senior vice president being in the chair, one new member was elected, he was on his father's side the great great great-grandson of Sir George Baker, F R S, the first president of the society, and on his mother's side he bore a similar relationship to Dr James Ware, the second president A sum of £2425 was voted for the payment of half yearly grants to 62 widows and 4 orphans Membership is open to any registered medical man who, at the time of his election, is resident within a twenty mile radius of Charing Cross Particulars from the secretary at 11, Chandos Street, London, W 1

Travelling Fellowships

The Medical Research Council announce that they have awarded Rockefeller fellowships in medicine to the following candidates who intend to work at centres in the United States during the academic year 1939–40 :—

Guy Blackburn M B Camb, F R C S, demonstrator in anatomy, St Bartholomew's Hospital London

John Carson Dick M D Glasg assistant pathologist, University of Glasgow and Glasgow Royal Infirmary

John Louis Henderson M D Edin, M R C P E assistant, department of child life and health University of Edinburgh

Ronald Stanley Illingworth M D Leeds, M R C P, D P H, resident medical assistant and clinical pathologist, Hospital for Sick Children Great Ormond Street London

Robert Manoah Kark, M R C P formerly demonstrator in pathology and registrar to medical outpatients, Guy's Hospital, London

Edward Peter Sharpey Schafer M B Camb, M R C P first assistant department of medicine, British Postgraduate Medical School London

The council have also awarded Dorothy Temple Cross research fellowships to the following candidates who intend to study problems of tuberculosis at centres abroad during the academic year 1939–40 :—

Robert Roger Henderson M D Lond M R C P resident assistant physician, St Thomas's Hospital London

Arthur Harold Makins Siddons M B Camb, M R C P F R C S, chief assistant genito urinary department, St George's Hospital London

John Michael Walzer, M D Camb M R C P, medical first assistant and registrar, London Hospital

Royal Free Hospital

The A M Bird postgraduate scholarship in pathology for 1939–40 has been awarded to Dr Audrey Fraser and the Mabel Webb and A M Bird research scholarship to Dr Alice Stewart

Middlesex Hospital

The prize-giving ceremony of this school will be held at the Queen's Hall, Langham Place, London, W 1, on July 20, at 3 P M Mr S A Courtauld, chairman of the council of the school, will be in the chair Prof W B Tuck, D Sc, will deliver an address on the chemical elements, and Sir Edward Mellanby, F R S, will distribute the prizes and medals

A research fellowship in medical radiology to the value of £100 per annum has been endowed at the school by the Duke of Bedford in memory of his wife The fellowship, which is to be known as the Duchess of Bedford fellowship, is intended to further experimental research in medical radiology It is open to qualified men or women of any nationality, and may be held for a period not exceeding three years The late Duchess of Bedford was a member of the Society of Radiographers

Maudsley Hospital

Today, Friday, July 14, the Earl of Athlone, chancellor of the University of London, will open a new extension at this hospital The institution owes its inception to an offer made in 1908 to the London County Council by the late Dr Henry Maudsley to contribute £30,000 towards the cost of erecting and equipping a hospital for the early treatment of cases of curable mental illness, the provision of exact research, and the provision of medical teaching on such disorders The building was originally designed to hold 108 beds, a number which has gradually increased to 200 In one year upwards of 4000 outpatients, including children, are now seen, while the number of inpatients admitted each year has grown to between 800 and 900 A new outpatient department, special treatment blocks, additional accommodation for the central pathological laboratory, and an operating theatre were added in 1936 The present extensions include blocks for private patients in single rooms and a block specially designed for the inpatient treatment of children Conditions for admission of private patients are that they shall go of their own free will and that the outlook for recovery is good The children's block is described as a completely new departure; "nowhere in Great Britain is there specialised inpatient accommodation for children whose troubles need psychiatric investigation and treatment" A detached block has been constructed to serve as an outpatient clinic for children and is already in full work.

British Empire Cancer Campaign

At a meeting of the grand council of this campaign held in London on Monday last, the following grants were approved £400 to Mount Vernon Hospital for research by Prof T Weigert, £495 to the Strangeways Research Laboratory, Cambridge, for the salary of its physicist, and £400 to Sir Robert Muir and Dr P R Peacock for research at the Glasgow Royal Cancer Hospital by Dr Stephan Beck The total grants made this year now amount to more than £10 000

The council approved of the formation of a University of Cambridge research centre of the British Empire Cancer Campaign The initial committee to supervise this centre will consist of Dr H R Dean vice-chancellor and professor of pathology, Dr J A Ryle, regius professor of physic, Sir Gowland Hopkins F R S professor of biochemistry, and Miss Honor Fell director of the Strangeways Research Laboratory The centre will coördinate all cancer research at Cambridge and will itself initiate and direct research in the same way as the recently formed University of Oxford research centre of the campaign The council acceded to a request for affiliation from the Cancer Research Fund Committee (1934) of Northern Ireland

Mr J A Crowther Sc.D (professor of physics in the University of Reading) Mr H T Flint, D Sc (director of physics at Westminster Hospital), Dr R W Scarff (hon secretary of the scientific committee of the campaign) and Dr D G Walker (representing the British Dental Association) were elected members of grand council

An Appointment to India

Prof. F C Minett, D.Sc, director of the research institute in animal pathology at the Royal Veterinary College, London, has been appointed director of the Imperial Veterinary Research Institute of the government of India

Leverhulme Research Fellowships

A Leverhulme fellowship has been awarded to Mr. D. Ll. Griffiths, clinical assistant in the orthopædic department of Manchester Royal Infirmary Mr Griffiths will compare the radiological and histological features in bone tumours.

Amalgamation of Hospitals at Newcastle-on-Tyne

The governors of the Newcastle Throat, Nose, and Ear Hospital have decided to amalgamate the hospital with the throat and ear department of the Newcastle Royal Victoria Infirmary. The joint hospital will be housed in a new building adjacent to the infirmary.

A Visit to Germany

The offices and warehouses of Bayer Products Ltd. will be closed from noon on Friday, July 21, until 9 30 A.M. on Tuesday, July 25, when the entire staff of 150 from the London, Manchester, and Dublin offices of the firm is being taken to Germany for a long week-end visit to the Bayer laboratories at Leverkusen and Elberfeld. Urgent supplies during this period can be obtained from Messrs John Bell and Croyden, 50, Wigmore Street, London, W.1 (Welbeck 5555), or from Mr. R Woolby Brooke, 38, Gloucester Road, London, S.W.7 (Western 0123)

Appointments

AUCHINLECK, G M, L R C P, resident assistant pathologist at the Royal Free Hospital, London

BARRETT, N. R, M Chir Camb, F.R C S, surgical registrar at the Hospital for Consumption, Brompton.

BOLTON, MARJORIE, M B Lond, medical officer to the V.D. department, Guy's Hospital, London.

BONNELL, JANE, M B Lond., assistant medical officer at the Harmston Hall Colony, Lincolnshire

BOYD, MARJORIE, M D Dubl, M R.C O.G, resident assistant obstetrician at Kingston County Hospital, Surrey.

CABLL, J V, M D N.Z, M R C P, resident assistant medical officer at the Redhill County Hospital, Edgware

CLEGG, J W, M R C S, assistant in clinical pathology at the British Postgraduate Medical School, London.

COLLINS, L A, M B Camb., D.P M, assistant county medical officer for Dorset.

COMERFORD, C. H, M D Dubl., D P.H, D P.M, deputy medical superintendent at Bexley Hospital (L C.C).

CRAWFORD, A V B, M.B. Dubl., D P.H, assistant medical officer of health for Barnes.

CRAWFORD, F J. H, M D Lpool, D.P H., barrister-at-law, deputy medical officer of health for Cornwall.

FAIRLIE-CLARKE, G. A., M.B Lond., resident surgical officer at the Kent and Sussex Hospital, Tunbridge Wells.

FERRIMAN, DAVID, D M. Oxfd, M.R C P., first assistant in the medical outpatient department of the London Hospital.

FITZGERALD, E. J, M D. N U.I, medical superintendent at South Ockendon Colony, Essex.

FITZGERALD, F. P, M B Dubl., F.R C S I, assistant surgeon to the orthopædic department of the St. John Clinic and Institute of Physical Medicine, London

GOUDIE, MARGARET M, M B. Glasg., assistant medical officer for Middlesex

GRAY, CHARLES, M.B. Manc., F R C.S, first assistant in the department of surgery of the British Postgraduate Medical School, London

INSH, ALICE M, M B Glasg., assistant medical officer at the Stirling District Mental Hospital

LLOYD, O. G, M B Lond, D P.H, assistant medical officer of health for Newport, Mon

LODGE, THOMAS, M B. Sheff, D M R E, first assistant in the department of radiology, Royal Sheffield Infirmary and Hospital

MEADOWS, S P., M.D. Lond., M R C P, assistant physician to the Maida Vale Hospital for Nervous Diseases, London

MITCHELL EVELYN, M B Edin, outpatient medical officer at the Belgrave Hospital for Children, London

MOIR, A. R M., M B Edin, D P H, deputy medical officer of health for Oldham

MURRAY, C J B, M S Lond, F R C S, surgical registrar at the Radcliffe Infirmary, Oxford.

PILKINGTON, FRANCIS, M B Camb, M R C P, D.P.M, deputy medical superintendent at the Warwickshire and Coventry Mental Hospital

RACKOW, A. M., M B Lond, D M.R E, radiologist to the Evelina Hospital for Sick Children, London

SCHNITZLER, ROBERT, M.R C P E, resident assistant physician at Kingston County Hospital, Surrey

SCHOLEFIELD, G L M, M.B N Z, resident surgical officer at the Royal Masonic Hospital, London.

SEWELL, J. P., M.B Melb, D.L.O., registrar at the Central London Throat, Nose, and Ear Hospital

SHARP, H. S, M B Camb, F.R C S, chief assistant to the ear, nose and throat department, St Thomas's Hospital, London.

THOMSON, J M, M B. Aberd, senior assistant medical officer at the Isolation Hospital, Romford

TUBBS, O S, B Chir Camb., F.R C S, surgical registrar at the Hospital for Consumption, Brompton.

WALSHE, F. M. R., M.D. Lond., F.R C P., member of the civil consulting staff to King Edward VII Convalescent Home for Officers, Osborne.

*WAUDBY-SMITH, W F., M R C S., assistant school medical officer for Berkshire

*WEBB, JOSEFINE W., M.B. Lond., assistant medical officer for Berkshire

WERBELOFF, LESLIE, M B. Cape Town, D M.R E., assistant radiotherapist to the Royal South Hants and Southampton Hospital

WRIGHT, GAVIN, M B. Camb, resident anæsthetist at the Queen Elizabeth Hospital, Birmingham.

Hospital for Sick Children, Newcastle-on-Tyne.—The following appointments are announced —

OGILVIE, A. G, M.R Durh, M R C.P, hon. physician,
WATTS, WELDON, M S Durh., F.R.C S E., hon. surgeon;
KELLETT, C. E., M D. Camb, M R C P, hon. assistant physician;
DAVISON, GEORGE, M.D. Durh., M.R.C P., D C.H., hon. assistant physician; and
FEGGETTER, STEWART, M S. Durh, F.R.C.S., hon. assistant surgeon.

Colonial Medical Service.—The following promotions are announced.—

CALLANAN, J C J, M D Dubl, assistant director of medical services, Kenya,
CARMAN, J. A, M D Lond., D T.M. & H, specialist (anæsthetist), Kenya,
HAMILTON, I., M.D. Glasg., D.P.H., D T.M. & H., senior health officer, Nigeria;
HENRY, G H, L Med Dubl, medical officer, Nigeria;
MACKAY, A. G., M B Edin, D.T.M. & H, senior medical officer, Tanganyika Territory;
RAWSON, P H., M R C S, senior medical officer, Nigeria;
ROBERTS, C. E., B M Oxfd, F.R.C S E., D T M. & H., specialist, Zanzibar;
SHELLEY, H. M, F R F.P S G, M R C P., D T.M. & H., senior medical officer, Tanganyika Territory; and
SMITH, W. H., M B. Dubl., D.P H., medical officer, Kenya

Vacancies

For further information refer to the advertisement columns

Anglesey County Council —Asst. county M O.H., £600.
Banbury, Horton General Hosp —Res M O, at rate of £150
Barrow-in-Furness County Borough —Deputy M.O H and asst tuber O, £550
Bearstead Memorial Hosp, Underwood Street, E 1 —Res M.O, at rate of £100
Beckenham, Bethlem Hosp, Monks Orchard.—Res H.P., at rate of £150
Belgrave Hosp for Children, Clapham Road, S W 9 —Asst. physician
Benenden, Kent, National Sanatorium —H P., at rate of £150
Birmingham Maternity Hosp —Res M O. and registrar, £200
Blackpool, Victoria Hosp —H S to surgical unit 2, at rate of £175
Brighton, Royal Alexandra Hosp for Sick Children —H P, £150
Brighton County Borough —Sen M O. and asst. to M.O H., £900.
Burnley, Victoria Hosp —H P, at rate of £150.
Burnley County Borough —Asst M O, £500.
Cambridge, Addenbrooke's Hosp —H.S, at rate of £130
Colchester, Royal Eastern Counties' Institution —Asst M O, £350.
Coventry and Warwickshire Hosp —Res. M.O, £300.
Croydon County Borough —Asst M.O.H., £400.
Dudley, Guest Hosp —Res. surg. O, at rate of £250–£300 Also H S, at rate of £150
East Ham Memorial Hosp, Shrewsbury Road, E.7 —Hon radiologist
Essex County Council —District tuber officer, £700.
Evelina Hosp for Sick Children, Southwark, S E 1 —H S, at rate of £120
Glasgow Western Infirmary —Medical radiologist
Godalming, Surrey County Sanatorium.—First asst. M O, £570.
Grimsby and District Hosp —Res officers, at rate of £225 to £150
Harrogate, Royal Bath Hosp —Res M O, £200
Henley-on-Thames, Berks and Bucks Joint Sanatorium.—Second res asst M O £350.
Hull, Beverley Road Institution —Asst M O, £350
Hull Royal Infirmary —Second H P. and second cas. O, each at rate of £150.
Ilford, King George Hosp —Hon anæsthetist
Kettering and District General Hosp —H P, at rate of £150
Lancaster Royal Infirmary —Jun H S., at rate of £130.
Leicester, City Isolation Hosp and Sanatorium, Groby Road —Res M O, at rate of £300
Liverpool Heart Hosp, Oxford Street.—H P., at rate of £100 Also clin assts
London County Council —Sen asst M.O (grade II), £500 Asst M.O 's (class I), each £350. Also asst M.O 's (class II), each £250
London University —University readership in morbid anatomy, tenable at British Postgraduate Medical School, £800
Manchester, Ancoats Hosp —Two H S 's, one for orthopædics and one for joint post of H S to ear, nose and throat dept., and house physician, each at rate of £100.

* Subject to confirmation

Manchester, Christie Hosp and Holt Radium Institute.—Asst M O, £200 Also sen and jun res surg O's, each at rate of £150
Manchester, Langho Colony for Sane Epileptics—Med supt, £1050
Manchester, Park Hosp, Davyhulme—Res surg O, £500
Manchester, Royal Children's Hosp, Pendlebury—Res surg O and asst M O for outpatients' dept, each at rate of £150
Manchester Northern Hosp—Res H P and res H S, each at rate of £100
Manchester Royal Eye Hosp—Jun H S, £120
Manchester Royal Infirmary—Hon asst surgeon Jun asst M O in radiological dept £3.0 Med chief asst £300 Chief asst to surgical unit £250 Asst surgical officer, £70 Also H P's and H S's each at rate of £50
Manchester Victoria Memorial Jewish Hosp—Part time clinical pathologist, £200
Mansfield and District General Hosp—H P at rate of £150
Margate and District General Hosp—Res M O, £150
Mexborough, Yorkshire, Montagu Hosp—Res surg O, £400
Middlesbrough, Poole Joint Sanatorium, Nunthorpe—Med supt, £900
Ministry of Health.—Medical officers each £850
Newcastle-upon Tyne Royal Victoria Infirmary—Hon physician
Northampton General Hosp—H S, at rate of £150
Nottingham General Dispensary, Hyson Green Branch—Res M O £300
Oldham County Borough—Temporary asst M O H, £500
Paddington Metropolitan Borough—Temporary asst M O for air raid precautions services, £500
Portsmouth, Saint Mary's Hosp—Jun asst res M O, £250
Prescot, Whiston County Hosp—Sen res M O, £100
Preston County Borough—Asst M.O for maternity and child welfare £500
Prestwich Near Manchester County Mental Hosp—Asst M O, £550
Princess Elizabeth of York Hosp for Children, Shadwell E 1—Dental surgeon
Queen's Hosp for Children Hackney Road, E 2—H S and cas O, each at rate of £100
Royal Air Force.—Dental surgeons
Royal College of Physicians, Pall Mall East, S W 1—Milroy lecturer
Royal Naval Medical Service—Medical officers
St Helens Hosp Lancashire—Hon surgeon and deputy Honorarium £250 for the dual post
St John's Hosp Lewisham, S E 13—H S £100
St Mary's Hosp, W 2—Second res anæsthetist at rate of £125
St Peter's Hosp for Stone &c, Henrietta Street, Covent Garden, W C 2—H S, at rate of £15
Sheffield Royal Infirmary and Hosp—Res H S to ophthalmic dept, at rate of £80–£120
Southend-on Sea General Hosp—First H S, at rate of £100
Stafford, Prestwood Sanatorium—Jun asst M O, at rate of £300
Stockport County Borough—Asst M O H £500
Taunton, Taunton and Somerset Hosp—H S at rate of £125
Tunbridge Wells, Kent and Sussex Hosp—H S and cas O, £150
University of London King's College, Strand, W C 2—Lecturer in physiology, £350
Ventnor, Royal National Hosp for Consumption—Asst. res M O, at rate of £250
Wakefield Clayton Hosp—H S at rate of £175
Walsall General Hosp—Res surg O, £300
Weir Hosp, Weir Road Balham S W 12—Sen res M O, £250.
West Malling, Kent, Leybourne Grange Colony—Asst res M O, £230
Wickford, Runwell Hosp for Nervous and Mental Disorders—H.P, at rate of £150
Wolverhampton, Royal Hosp.—Asst res M O for gynæcological and obstet dept, at rate of £100
York County Hosp—H S to eye, ear, nose and throat dept, £150

ST GEORGE'S HOSPITAL, S W 1
THURSDAY—5 P.M, Dr Anthony Feiling neurological demonstration
HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W C 1
THURSDAY—2 P.M Mr J H Doggart Causes and Treatment of Squint in Children 3 P.M Mr Wylie McKissock The Diagnostic Value of Ventriculography and Encephalography in Intracranial Diseases
Outpatient clinics daily at 10 A.M and ward visits at 2 P.M
FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W 1
MONDAY to SATURDAY—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars Road, S E afternoon course in dermatology—ALL SAINTS' HOSPITAL Austral Street, S E 11, afternoon course in urology

Medical Diary

July 17 to July 22

SOCIETIES

ROYAL SOCIETY OF MEDICINE 1, Wimpole Street, W 1
TUESDAY.—5.30 P.M general meeting of fellows
WEST LONDON MEDICO-CHIRURGICAL SOCIETY
TUESDAY—5 P.M (West London Hospital, W 6), general meeting

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL Ducane Road, W 12
TUESDAY—4.30 P.M, Sir Arthur Hall Meningitis and Acute Infections of the Central Nervous System
WEDNESDAY—Noon clinical and pathological conference (medical) 3 P.M, clinical and pathological conference (surgical)
THURSDAY—2.15 P.M Dr Duncan White radiological demonstration 3.30 P.M, Dr A A Moncrieff Hygiene of the Newborn Child
FRIDAY—2 P.M, clinical and pathological conference (obstetrics and gynæcology) 2.30 P.M, Mr J D Hume Hernia and Its Treatment
Daily 10 A.M to 4 P.M, medical clinics surgical clinics and operations obstetrical and gynæcological clinics and operations

Births, Marriages and Deaths

BIRTHS

DARBISHIRE.—On July 8, at Bowness-on-Windermere, the wife of Dr S B Darbishire—a daughter
DUNLOP.—On July 10, the wife of Dr J Leeper Dunlop of Tetbury, Glos—a son
FISHER.—On July 3, at Abingdon, the wife of Dr J H Fisher—a son
MACEWAN.—On July 7, the wife of Dr Alastair MacEwan, of Llandudno—a daughter
MONTGOMERY SMITH.—On July 4, the wife of Dr W Montgomery Smith, of South Norwood—a daughter
RIVERS MOORE.—On July 4 at Port Shepstone South Africa, the wife of Dr Francis Rivers Moore—a daughter
SMALLHORN.—On July 5 at Ruskington, Lincolnshire, the wife of Dr Thomas Smallhorn—a son

MARRIAGES

HERTEN GREAVES—PORTER.—On July 8 at All Souls' Church, South Hampstead Edgar C Herten-Greaves, F R C S, to Patricia Margaret Porter
SPRATT—BARRY.—On July 1, at St Ethelburga's, London Leslie Spratt, M B, to Gladys Ida Barry
TAYLOR—BARBOUR.—On July 8 at St Andrew's Presbyterian Church Cheam, Robert Bicket Taylor, M B to Phyllis Jean Barbour

DEATHS

BLAIR.—On July 8, at Claygate, Surrey, Charles Samuel Blair, M D Durh, F R C S late of Richmond
BROWN.—On July 9, at North Bersted, Sussex, David Brown, M B R U I, of Tientsin N China.
BUCHANAN.—On July 9 at Watford, James Ronald Buchanan, M B Lond, in his 37th year
BUCKLAND.—On July 8, at Bournemouth, Francis Oke Buckland, M D Edin, aged 81
ELLIS.—On July 8 at Hintlesham, Suffolk, Henry Havelock Ellis, L.S.A, F R C P in his 81st year
HAMILTON.—On July 8 at St. Thomas's Hospital, Dennis Godfrey Hamilton, M R C S
HOLROYDE.—On July 2 at the Citadel Military Hospital, Cairo George Graham Hedingham Holroyde, M C, L.M.S.S.A., lieut-colonel R.A.M.C
MADDICK.—On July 6, Edmund Distin Maddick, C.B.E, F R C S.E, of Hove, aged 85
PURDIE.—On July 7, James Purdie, M B Glasg, of Brentford, aged 49
RECKITT.—On July 8 at Hatch End, Middlesex Edward Bass Reckitt, V D M D St And, lieut-colonel R.A.M.C(T), retired late of Little Hadham, Herts aged 87
SUMPTER.—On July 4, at Sheringham, Walter John Ernely Sumpter, M D Durh

N.B.—A fee of 7s 6d is charged for the announcement of Births Marriages and Deaths

THE LANCET 100 YEARS AGO

July 13, 1839, p 572

From William Farr's letter to the Registrar General on the first annual report of births, marriages and deaths

The registration of the causes of death, besides contributing to practical medicine, will give greater precision to the principles of physic Loose phrases are still current, for which numerical formulæ will be substituted Sydenham, one of the most accurate of medical writers, in speaking of small pox employed such terms as these (1661) "It provailed a little, but disappeared again" (1667–9) "The small pox was more prevalent in town for the first two years of this constitution then I ever remember it to have been" (1670–2) These terms admit of no strict comparison with each other, The present registry will furnish medical science with an unbroken series of observations expressed numerically

NOTES, COMMENTS, AND ABSTRACTS

JENNER AS ROYAL PHYSICIAN

THE fact that Edward Jenner was appointed physician extraordinary to George IV is omitted from most accounts of his life, including those given in the Dictionary of National Biography and the Encyclopædia Britannica. Nor is any reference to it made in the latest study of him, reviewed in these columns on Nov. 11, 1933 (p. 1093). In the best documented of all biographies of Jenner written by John Baron and published in 1838, his appointment seems to have been discovered after the book had been written, because there is no mention of it in the text except in an appendix of documents, nearly all of which were found in the possession of Jenner at his death, and very prominently in the title, which runs "The Life of Edward Jenner, M.D., LL.D., F.R.S., Physician Extraordinary to His Majesty George IV. . . ." The document is listed thus: "1821. LONDON. March 16.—Appointment of Dr. Edward Jenner to be Physician Extraordinary to the King of Great Britain." Possibly, or even presumably, Jenner attended a member of the royal family for the purpose of vaccination. Queen Victoria was vaccinated in 1819, but we have not traced her vaccination to Jenner. The fact that Jenner was a very sick man in 1821 and died in 1823 may be the reason why his appointment was afterwards overlooked.

Baron's statement has received confirmation by the sale for £21 10*s* at Sotheby's on June 12 of the original manuscript oath signed by Jenner in 1821 on his appointment as physician to George IV, together with a letter from Jenner returning the documents. At the same sale a letter from Marcello Malpighi to Cardinal Gastaldi in 1684, containing a diagnosis and prescription for the cardinal's sister, fetched £7 10*s*., and nineteen letters (about thirty pages) from Lazaro Spallanzani on scientific subjects, 1766–93, were sold for £28.

THE BRAIN MADE EASIER

IN presenting what he calls "a materialistic conception of brain as an instrument of mind," Dr. R. J. Berry of Stoke Park Colony, Bristol, has attempted to describe in simple language and within the compass of a small book the structure, evolution and development of the human brain (Your Brain and its Story. London: Humphrey Milford, Oxford University Press. 1939. Pp. 165. 7*s*. 6*d*.). Written in lively style, the book opens with a biological summary of the development of nervous systems, starting with those of primitive and simple animals. There follows an interesting chapter on the basic types of brain and their recapitulation in man, and the author goes on to discuss, among other things, the twin nervous systems, the service of the senses, and how the brain works. The closing chapters deal with mental defect, its correlation with the size and demonstrable pathology of human brains, and some of its regrettable effects on human behaviour. Mr. H. D. Steele illustrates the book with many beautiful and accurate drawings. Unfortunately the complexity of the subject makes an exposition fully comprehensible to the layman almost impossible, but Dr. Berry has nearly achieved it.

TRANSFUSION SYPHILIS

No doubt there are many more cases of syphilis insontium than are revealed. Another example of conveyance of infection by blood-transfusion is recorded by F. Ronchese (*New Engl. J. Med.* 1939, 220, 556). The patient was a boy of 13 who urgently required a transfusion for cachexia. The blood of the donor, a friend, was tested for agglutination, but no Wassermann examination was made. The transfusion was a striking success, but the boy developed a secondary rash in a few weeks, and it turned out that the donor had had a penile sore at the time he gave his blood.

Ronchese has questioned a number of American hospitals about their procedure with reference to serological testing of blood-donors. The answers to the questionnaire, if given at all, were often unsatisfactory and at best the donors were tested only every six months. Ronchese insists that much greater care should be taken and goes so far as to suggest that serological and physical examinations should be made immediately before every transfusion.

THE UNIT OF PRACTICE

"More importance," said Sydenham, "is to be attached to the desires and feeling of the patient, provided they are not excessive or dangerous, than to doubtful and fallacious rules of medical art" Prof. D. W. Propst of Illinois takes this as the text of a book written with the object of systematising his own knowledge of the general principles underlying the practice of medicine and of arranging that knowledge in a form palatable to students (The Patient is the Unit of Practice. Springfield, Illinois: Charles C. Thomas. 1939. Pp. 219. 16*s*.). The first part is concerned with the nature of disease, with constitution and heredity, man's adaptability to environmental changes, and his failure so to adapt, resulting in disequilibrium. The second deals with diagnosis—"the working hypothesis of the clinician"—and the third with the basic therapeutic principles of practice: rest, diet, symptomatic treatment and psychotherapy. The reader is reminded of Allbutt's words, that the patients and not the diseases are the entities. This is one of the lessons to be learnt from a book, which, though it contains nothing strikingly original, is nevertheless a useful digest of much of that vaguely appreciated knowledge, steadily acquired and often subconsciously applied during a clinical lifetime.

MEDICAL JOURNALS AND BOOKS FOR CHINA

Dr. JOAN MCMICHAEL writes:—"The China Medical Aid Committee has recently received an appeal from Dr. Lim of the Chinese Red Cross Training School, at Kweiyang, for medical journals and medical and surgical textbooks. This training school, in the words of its own report, 'is attempting, in the fire of war, to build a firm base for the national health service of the new China' It cooperates with the Chinese Red Cross, the Army Medical Service Corps, and the National Health Administration.

"Many of your readers who do not file back issues of their medical journals would doubtless be willing for them to be used in such a cause. May I therefore take this opportunity of appealing through your columns to the profession both for medical journals (numbers for the past two years would be most welcome) and for medical textbooks suitable for the training of young doctors, nurses, dressers, and ambulance units? Surgical and first-aid textbooks are most urgently required, but any good recent (within the last five or ten years) textbooks would be gratefully accepted. Journals and books should be sent to Dr. Joan McMichael, Organising Secretary, China Medical Aid Committee, 121, Westbourne Terrace, London, W.2. Journals may be sent monthly, or collected and sent for several months together. All books and journals will be forwarded direct to China, and the British Fund for the Relief of Distress in China, to which we are affiliated, is able to secure free carriage for us."

THE MEDICAL DIRECTORY.—Messrs. J. and A. Churchill Ltd write: "To maintain the accuracy of our annual volume we rely upon the return of our schedule, which has been posted to each member of the medical profession. Should the schedule have been lost or mislaid we will gladly forward a duplicate upon request. The full names of the doctor should be sent for identification." Messrs. Churchill's address is 104, Gloucester Place, London, W.1.

ADDRESSES AND ORIGINAL ARTICLES

THE MECHANISM OF DIABETES MELLITUS*

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III—HUMAN DIABETES MELLITUS

UP to, and for some time after, the discovery of insulin it was tacitly assumed that all cases of human diabetes could be explained by deficiency of insulin, but during the last decade suspicions have arisen regarding the correctness of this assumption These suspicions had their origin in clinical experience which compelled the realisation that the efficiency with which insulin acts in different patients, and in the same patient in different states of health, varies considerably This disclosed the possibility that a state of diabetes might result from inefficient action of insulin as well as from lack of insulin

DIFFERENTIATION INTO TYPES

Most important clinical observations have been made in this field by Falta and his colleagues [40 41] Using four different tests Falta claims to have differentiated diabetes into two types (1) the insulin sensitive type, which requires little insulin to prevent the excretion of many grammes of urinary sugar, tolerates little or no increase in insulin dosage without showing hypoglycæmic symptoms, and reacts to withdrawal of treatment by profuse glycosuria, and (2) the insulin resistant type, which requires many units of insulin to deal with each gramme of urinary sugar, tolerates many units of insulin above the dose required to keep the urine free of sugar, and on cessation of treatment shows little or no glycosuria The response to the tests does not, however, permit a clear differentiation of diabetics into two groups, and most cases occupy an intermediate position between the extreme insulin sensitive and the extreme insulin resistant patients

The work, previously discussed, on the effect of dietetic variations on insulin action demonstrated that the efficiency with which insulin acted depended on the factor of insulin-sensitivity, and this suggested the possibility of a type of diabetes due to insensitivity to insulin It was speedily found that comparison of the effects of injected insulin on the blood sugar of different diabetic patients was impracticable owing to the influence of the wide variations in the fasting blood sugar level, and a new test was sought which would overcome this difficulty This has been found in the application of the observation, previously made on animals [42] and since confirmed on man,[43] that the effect of insulin in suppressing hyperglycæmia due to administration of glucose is determined by the sensitivity to insulin The insulin glucose test consists of injecting intravenously a dose of insulin (5 units per square metre of body surface) and immediately afterwards giving a dose of glucose (30 g per square metre of body surface) by mouth Blood sugar estimations are made before, and at short intervals during the first hour after, the insulin and glucose are given Diabetic patients give two distinct types of response to this test [44] (fig 7) (1) the insulin sensitive type, in which the injected insulin comes into action immediately and suppresses the alimentary hyperglycæmia, and (2) the insulin-insensitive type, in which the injected insulin comes into action slowly and weakly and suppresses the alimentary hyperglycæmia to only a slight extent In the investigation of the significance of these two types of response the insulin glucose test was compared with the blood sugar glucose tolerance curve under the same conditions and after the same dose of glucose

The blood glucose tolerance curve can be measured for purposes of comparison by the area enclosed by it and the fasting blood-sugar level. When the blood glucose tolerance curve and the insulin glucose curve, obtained from the same patient under the same conditions, are drawn on the same graph, the area between represents the effect of the insulin injected in the insulin glucose test This area is called the insulin area (I), and the ratio between the insulin area (I) and the glucose tolerance area (G)—the I/G ratio—is a measure of the sensitivity to insulin of the particular subject When the I/G ratio is low, the sensitivity to insulin is diminished, when it is high, sensitivity is increased [45] This ratio has the great advantages that it is little affected by minor experimental errors, and that it allows for the effect of hyperglycæmia in facilitating insulin action It does not, however, take into account the height of the fasting blood sugar level at which the tests are performed, and it therefore remains a measure of sensitivity to insulin at a particular blood sugar level In insensitive diabetics the average value of the I/G ratio is 0 51 (with a standard deviation of the series of 0 11) The lowest value of the I/G ratio in the insulin sensitive diabetics is 0 98—1 0, nearly four times the standard deviation distant from the mean of the insulin insensitive cases The two groups of cases are, therefore, clearly differentiated and do not merge into each other [47] Using their own modification of the insulin glucose test, de Wesselow and Griffiths [21] have stated that all grades of response from a typical sensitive to a typical insensitive may be obtained. This conclusion is due to their modification of the test failing, owing to infrequent blood sampling, to differentiate between the two types of response The insensitive type of response is clearly demarcated from that of the sensitive type

When one comes to consider the clinical features of the cases giving the different responses to the insulin glucose test, it is found that, although there is a typical clinical group of cases giving each type of response, cases clinically atypical are frequently encountered in either group On the whole the sensitive diabetics tend to be younger and thin and to have a normal blood pressure and normal arteries, and as a rule their disease is of sudden and severe onset The insensitive diabetics, on the other hand, tend to be elderly and obese and to have hypertension and arteriosclerosis, and in these patients the onset of the disease is insidious These two groups of diabetics are identical with the cases typical of the two groups distinguished by Falta's tests,[40 41] and he also has found that cases are frequently met with in one group which clinically are typical of the other group A clearer clinical distinction of the diabetics giving the two different responses to the insulin glucose test is found in regard to the reaction of the different groups to treatment Kerr and I have found, as Falta

* The Goulstonian lectures for 1939 delivered before the Royal College of Physicians of London on March 2, 7, and 9 Lect I and the first and second parts of II appeared in THE LANCET of July 1 8 and 15 respectively

has,[40] that sensitive diabetics easily respond to an overdose of insulin and speedily develop ketosis if treatment is insufficient, whereas the insensitive type can tolerate a relatively large excess of insulin without showing symptoms of overdosage and rarely develop ketosis

The two groups of diabetics appear to react differently to dietary changes. In the experience

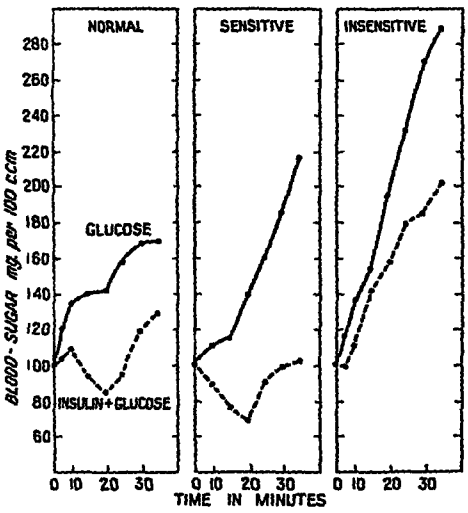

FIG. 7 — Glucose-tolerance and insulin-glucose curves from a normal subject, from an insulin-sensitive diabetic, and from an insulin-insensitive diabetic. The composition of the diet was approximately the same in each case.[67]

of Dr. Kerr and myself increase of dietary carbohydrate in the treated sensitive diabetic produces no increase in glycosuria or insulin requirements, whereas in the treated insensitive diabetic such a change increases glycosuria and consequently increases the insulin requirements.[67] We are in some disagreement with Falta on this point. At first he thought that the effect of carbohydrate in his two groups of diabetics, which we assume to correspond to our two groups, was the reverse of our findings, but recently he has modified his opinion and stated that increase of dietary carbohydrate may not unbalance sensitive diabetics.[40] MacBryde,[99] using Falta's tests, has agreed with Falta's original opinion, but his periods of observation on each diet were too short to allow stabilisation after each dietary change, and his published results, so far as they go, can equally well be interpreted as showing the opposite of what he claims. In support of our findings we have observed that increase of dietary carbohydrate in sensitive cases tends to cause a fall in the fasting blood-sugar and an improvement in the glucose-tolerance curve, whereas in insensitive diabetics the reverse tends to happen. In sensitive cases and in normal subjects increase of dietary carbohydrate produces an increased sensitivity to insulin, as judged by the increase in the value of the I/G ratio, whereas in insensitive patients little or no change in sensitivity takes place.[67] But it has not been possible to change one type of diabetic response into the other by altering the composition of the diet. Card[20] found no effect of variation in dietary carbohydrate on the insulin-depression curve in diabetics. Within the range of dietary variation that he studied little effect would have been discovered even in normal subjects.

Our results on the different effect of diet on the two types of diabetics appear to offer a means of reconciling the two conflicting schools of thought on the dietetic treatment of diabetes. One school maintains that the best results and economy in insulin dosage are obtained with low-carbohydrate diets; the other that better results are obtained with high-carbohydrate diets, and that such diets do not necessitate increase of insulin dosage. If our findings are correct, it is clear that increase of dietary carbohydrate will increase the insulin requirements of insensitive diabetics, whereas in sensitive cases it will cause either a reduction or no change in the insulin dosage. We emphasise, however, that, although insensitive diabetics may require less insulin on a low-carbohydrate diet, this is no proof that such a diet is the optimum for these patients.

The slight effect of insulin in suppressing alimentary hyperglycæmia in the insensitive type of patien may result from one of two causes: an impairment of the action of insulin in accelerating removal of blood-sugar in the peripheral tissues, or a masking of insulin action by excessive secretion of sugar by the liver. In man an indication of the effect of insulin on the peripheral removal of sugar can be obtained by measuring the changes in the capillary-venous blood-sugar difference. It was found by applying this method to the insulin-glucose test that in the normal subjects and sensitive diabetics insulin greatly accelerated the rate at which the peripheral tissues removed sugar from the blo whereas in the insensitive patients little acceleration of the rate of removal resulted.[66] This work has been confirmed by Marble.[99 100] Griffiths[51] finds the peripheral effect of insulin reduced in all diabetics but more so in insensitive than in sensitive cases. It appears, therefore, that in the sensitive diabetic, as in the normal subject, insulin increases the removal of sugar from the blood by the peripheral tissues, whereas in the insensitive diabetic this action is impaired.

The question now arises as to what is the essential difference between the two types of diabetics. In the insulin-sensitive diabetic administration of insulin turns the diabetic sugar-tolerance curve into an essentially normal insulin-glucose curve (fig. 7), and this suggests that the disease in this type of case is due to lack of insulin. Supporting this conclusion is the apparently normal action of insulin in the peripheral tissues of sensitive patients, their rapid clinical response to insulin and the demonstration, by the I/G ratio, that such cases behave as would be expected were there a deficiency of insulin.[67] In the insensitive cases, on the other hand, the insulin-glucose response suggests some interference with the action of insulin, and the low values of the I/G ratio show that these cases are less sensitive than normal to injected insulin. Further, the impairment of insulin action in the peripheral tissues has been demonstrated, and from theoretical considerations it has been shown that the quantitative effect of insulin in such cases is such as would be expected were the disease due not to lack of insulin but to insensitivity to insulin[67] (fig. 8).

Up to this point we have been considering only the events during the first hour of the glucose-tolerance and insulin-glucose curves—i.e., the rate at which the injected insulin comes into action rather than the total effect If the curves are prolonged to three hours, the change in the insulin area indicates the total effect of the injected insulin. In sensitive diabetics and normal subjects insulin action is strong

during the first hour and has diminished considerably by the third hour In insensitive diabetics, on the other hand, insulin action is relatively weak during the first hour, strong in the second, and only little less in the third The result is that in the two types of case the total action of insulin differs relatively little, whereas the rate at which insulin comes into action differs considerably [67] This suggests that insulin is not destroyed more rapidly in the insensitive diabetic, but merely that it comes into action more slowly Such a conclusion would be compatible with the insulin insensitivity being due either to the presence of a retarding but not destructive inhibitor of insulin or to the relative lack of an activator or coenzyme of insulin These possibilities are not mutually exclusive The fact that the total action of insulin is not grossly different in the two types of cases explains two otherwise puzzling clinical points—namely, that the total insulin requirements in insensitive diabetics are not on the average higher than in the other group, and that, when extra carbohydrate is added to the diet of insensitive patients, the daily increase in glycosuria is only a fraction of the excess ingested

Some interesting results on the utilisation of glucose in different diabetics have recently been presented by Newburgh and his co workers,[105] who found that in young thin diabetics the capacity to oxidise glucose was reduced, whereas in elderly obese diabetics the capacity was normal Diabetics of this latter type are usually insensitive, and observations on the absolute effect of insulin in these latter patients are relevant to Newburgh's results. In the normal subject the effect of insulin on alimentary hyperglycæmia is approximately proportional to the

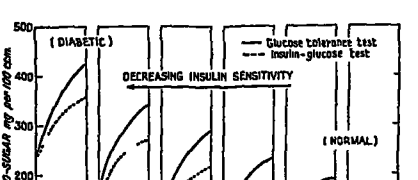

FIG 8—A series of diagrams showing the effect of decreasing insulin-sensitivity on the blood glucose tolerance curve and the insulin glucose curve The series depicts responses grading from those of a normal subject to those of a frank insulin insensitive diabetic

degree of hyperglycæmia on which it acts when insulin sensitivity is kept constant by giving a diet of the same composition In insensitive diabetics receiving the same diet this proportionality breaks down, but the amount of blood sugar removed by insulin in insensitive patients remains in most cases practically the same as in normal subjects despite the increased hyperglycæmia on which the insulin is acting (fig 8) Thus at hyperglycæmic levels the effect of insulin on the majority of insensitive diabetics is approximately the same as at lower levels in normal subjects This indicates that the elevation of the blood sugar in insensitive diabetics is adequate to compensate for the diminished ability of the tissues to deal with carbohydrate under the influence of insulin It is not improbable that, when the disease is thus compensated, the ability to oxidise ingested carbohydrate is only slightly impaired The relatively mild clinical course in such patients is readily understandable on the basis that in them diminished ability to deal with carbohydrate is largely compensated In the sensitive diabetic, in whom disease is thought to be due to lack of insulin, the situation is different Diminished ability to deal with carbohydrate consequent on lack of insulin appears usually to be more severe than when this disability is due to insensitivity to insulin, and consequently adequate compensation often is not achieved In the absence of adequate compensation it is not surprising that the ability to oxidise ingested carbohydrate is impaired, and that the clinical course in such patients is severe and if untreated ends rapidly with death in diabetic coma

NATURE OF INSENSITIVITY TO INSULIN

The diabetes developing in acromegalics [41] and in cases of Cushing's syndrome [67] is of the insulin-insensitive type as judged by the insulin glucose test The following case illustrates the extreme degree of insulin insensitivity in such cases and its apparent amelioration by X-ray irradiation of the pituitary gland.

A woman aged 40, a patient of Dr Charles Miller, presented a classical picture of Cushing's syndrome, and she had had mild diabetic symptoms during the previous nine months A total dose of 25 units of insulin daily was sufficient to clear the urine of ketones, but she still continued to pass large quantities of sugar Her fasting blood-sugar level averaged 142 mg per 100 c cm , and her glucose tolerance curve was frankly diabetic The insulin glucose test was of the insensitive type, the I/G ratio being 0 39 X-ray irradiation of the pituitary region was carried out, and the patient rapidly became sugar-free and remained so, even when the dose of insulin was gradually reduced to 5 units daily.

On readmission to hospital ten months later her fasting blood-sugar level, when she was receiving the same diet as previously but no insulin, averaged 102 mg per 100 c cm , but her glucose-tolerance curve was still of the diabetic type Her sensitivity to insulin had, however, increased, with the result that the I/G ratio had risen to 0 67, the normal average for her age-group being 0 86 Concurrently with this improvement in the diabetic condition the blood-pressure fell from an average of 175 mm to an average of 120 mm Hg, and menstruation became regular

Since this time a further course of irradiation has been given, the blood-pressure now averages 105 mm , and she remains sugar-free without taking insulin. In this case, with the institution of measures directed against the hypophysis, the clinical condition improved and concomitantly her sensitivity to insulin increased

Extracts of the anterior hypophysis produce, when injected into normal animals, a syndrome resembling diabetes mellitus and an insensitivity to insulin. By injection of crude extracts into normal rabbits diabetic sugar tolerance curves and an insulin insensitive type of response to the insulin glucose test can be produced

Many claims have appeared in the medical journals recently of the isolation from the blood or urine of groups of diabetic patients of substances which antagonised insulin action None of the claims has received adequate confirmation , some have been refuted It is of interest that no trace of any substance with the properties found in extracts of the anterior hypophysis can be demonstrated in the blood of animals rendered completely insensitive to insulin by the injection of such extracts The

single case reported by Glen and Eaton [48] requires notice, however, as of exceptional interest The patient was a diabetic who was extremely resistant to insulin, and injection of her serum into rabbits produced a state of insensitivity to insulin which resembled in many respects the resistance produced by anterior-pituitary extracts.

ANTERIOR-PITUITARY GLAND AND PRODUCTION OF DIABETES MELLITUS

The most striking work on the production of diabetes since von Mering and Minkowski demonstrated the effects of pancreatectomy has been initiated by Houssay's researches on the anterior-pituitary gland Houssay early showed that injection of extracts of this gland produced temporarily a diabetic [73] state, and recently Young [140 141] has shown that injection of increasing doses of these extracts into normal dogs produces a state of permanent diabetes This effect is produced by crude saline extracts of the fresh gland By fractionation these crude extracts can be separated into two parts: (1) the glycotropic factor, which antagonises the action of insulin but does not produce on injection into normal animals either a rise of blood-sugar or diabetes, and (2) the diabetogenic fraction, which also antagonises insulin but in addition raises the blood-sugar produces ketosis, and on continued injection ultimately leads to permanent diabetes. The sequence of events on injection of the diabetogenic extract is significant. After two or three days glycosuria, hyperglycæmia, and some degree of ketosis appear, but, if the daily dose of extract is not increased, these disappear spontaneously in a further few days. By increasing the dose of extract as soon as the glycosuria begins to fall, a sustained hyperglycæmia and ketosis can be maintained, and after two or three weeks of injection diabetes results. While receiving injections the animal steadily gains weight If at any time during this period the injections are stopped, the animal reverts to a normal state The diabetes ultimately produced is severe Glycosuria, ketonuria, and hyperglycæmia are considerable but easily influenced by the diet Glycosuria is increased by carbohydrate administration and decreased by its restriction Ketonuria is increased by a fatty diet but to a greater extent by a protein diet. These diabetic dogs can live for long periods without insulin, but, if insulin is given and then suddenly withdrawn, death in coma may result Biopsy and autopsy specimens of the pancreas show degeneration of the islets of Langerhans, [112] and Best and Campbell [12] have found no appreciable quantity of insulin in the pancreas of such animals

Perhaps the most important aspect of Young's work lies in its having suggested a new principle in pathology He has shown that injection of extracts which in single doses produce transient diabetes may, if repeated during a relatively short time, produce permanent diabetes. The possibility is thus raised that a short period of over-function in an endocrine gland may lead to a permanent derangement of body function, and that this derangement may be, at least in part, due to lesions of a second endocrine gland If this be so, the failure to demonstrate excess of anterior-pituitary factors in established cases of diabetes mellitus or of Graves's disease may be explicable, although it is possible that such factors may be demonstrable during the period when the disease is developing

It is of interest to consider Young's experimental diabetes and the clinical diabetes associated with known lesions of the anterior-pituitary gland A case has previously been reported of a woman suffering from diabetes mellitus and Cushing's syndrome in whom the diabetes was alleviated by X-ray irradiation of the pituitary region; but this desirable result is not always obtained, and as an example of this failure the following case may be cited

The patient, a woman aged 46, was known to have had glycosuria, hypertension, and amenorrhœa for the previous eight years. On examination she was seen to be red-faced and fat, especially on the trunk, and had a few cutaneous striæ on the lower abdomen. Her sugar-tolerance curve showed definite but moderate diabetes. Several courses of X-ray treatment to the pituitary region produced a fall in blood pressure from 270 mm. to 180 mm. Hg, lasting six *months*, but *the glycosuria steadily* increased, with the result that now she requires insulin.

It is possible that this case may have been due to suprarenal cortical tumour, but the fall in blood pressure, when the pituitary region was irradiated, gives some weight to the opinion that the pituitary gland was concerned in her condition. The different result in each case of irradiation may perhaps be explained as follows. In the first case the irradiation was given before diabetes was established at a time corresponding to the period of injections in Young's dogs In the dog cessation of injections at this stage allows the metabolism to return to normal; in the patient at a similar stage restriction of secretions of the diabetogenic factor by the hypophysis would, if it occurred, be expected to produce a similar result In the second case irradiation was not given until the diabetes was established at a time corresponding in Young's dogs to the stage when injections have ceased and permanent diabetes with lesions of the islets of Langerhans has been established It has been noted already that cases of diabetes mellitus associated with hyperpituitarism are insulin-insensitive. During the period of injections Young's dogs are also insensitive to insulin, but after permanent diabetes is established they are apparently insulin sensitive.[142] Whereas the diabetes of these animals during the injection stage may be due to antagonisation of endogenous insulin by pituitary factors, it is clear from the lesions in the pancreas that the permanent diabetes is due, at least in part, to insulin deficiency.

That the pituitary plays a secondary rôle as a factor in the compensatory mechanism seen in all types of diabetes has already been emphasised, but the indictment of the pituitary gland as a primary factor in ordinary human diabetes rests as yet purely on analogy In the case of insulin-insensitive diabetes this analogy is suggestive Insensitivity to insulin is characteristic of this type of diabetic, and insensitivity to insulin is produced by extracts of the anterior hypophysis.[23 73 141] By injection of such extracts into normal animals glucose-tolerance and insulin-glucose curves can be produced which are similar to those of insensitive diabetes [23] The variations in insulin-sensitivity resulting from dietary changes are mediated at least in part by the hypophysis [68] The observations that such dietary changes produce little if any effect on the sensitivity to insulin of insensitive diabetics might be expected if the disease in these patients were due to unrestrained oversecretion of the hypophysis Young's experiments very much suggest that oversecretion of pituitary factors may produce diabetes, but there is no evidence that the pituitary gland is responsible for the continuance of the diabetic state in his animals after they have ceased to receive injections At present the situation appears to be

that, although there is evidence that the pituitary gland may be responsible for the diabetes associated with hyperpituitarism, there is as yet no proof that this gland plays a primary part in the mechanism of other cases of diabetes mellitus

PATHOGENESIS OF DIABETES MELLITUS

It is definitely established that heredity [79] plays a part in the production of human diabetes mellitus, and there is evidence that obesity [80] precedes the development of diabetes in patients past middle age The suggestion that there exist two types of human diabetes mellitus raises the possibility that the pathogenesis of the syndrome of diabetes may not be the same in all patients The insensitive type of diabetes pre dominates in the older age group, and it is possibly not without significance that in normal subjects sensitivity to insulin, measured on a standard diet, decreases with age In young adult life the insulin-sensitivity, measured by the I/G ratio, averages about 1 0, and in few subjects does the value deviate far from this figure In the middle aged and elderly the average value falls to approximately 0 8, and the individual ratio ranges more widely Relative insulin insensitivity is common in and after middle life, and it is possible to collect observations ranging from mild insensitivity in normal subjects to pronounced insensitivity in definite diabetics [67] This suggests that an increasing influence of the factors making for insensitivity to insulin may ultimately produce diabetes mellitus Carbohydrate restriction is established as one of these factors, and it is perhaps possible that the long continued ingestion of a low-carbohydrate diet may precipitate diabetes mellitus There is some evidence that diabetics prefer low-carbohydrate diets, [71] and there is considerable evidence that diabetes is common in those countries and in those circumstances in which a low carbohydrate diet is taken [63] In explanation of these findings I have suggested that the hereditary predisposition to diabetes mellitus is widespread, and that in predisposed subjects the long continued ingestion of a low-carbohydrate diet may precipitate the disease [63] It has been shown that hypophysial activity is concerned in the variations in insulin sensitivity and glucose tolerance induced by changes in dietary carbohydrate [66] Young has demonstrated that *extracts of the hypophysis* can produce diabetes [140] If it can be shown that dietary changes induce the secretion of those hypophysial factors contained in the diabetogenic extracts, the above suggestion regarding the pathogenesis of diabetes may be justified But diet is not the only factor influencing insulin-sensitivity It is probable that sepsis and obesity have a similar influence, and for this reason they also may precipitate diabetes

SUMMARY

Diabetes mellitus is a disease in which the essential lesion is a diminished ability of the tissues to utilise glucose The high blood sugar in diabetes is a controlled and compensatory phenomenon, the object of which is to facilitate the utilisation of glucose by the tissues Thus hyperglycæmia is produced by increased activity of the liver, and the anterior-pituitary gland plays a prominent part in forwarding this activity The diminished ability of the tissues to utilise glucose is referable either to deficiency of insulin or to insensitivity to insulin, although it is possible that both factors may operate simultaneously Diabetes may be classified, according to which of these disorders predominates, into insulin sensitive and insulin insensitive types Insulin sensitive diabetes, which is thought to be due to deficiency of insulin, tends to be severe, and in it the *diminished ability* to utilise carbohydrate is inadequately compensated. Insulin insensitive diabetes, which is thought to be due not to lack of insulin but to insensitivity to insulin, is generally less severe, and in it the ability to utilise carbohydrate is usually more adequately compensated Certain extracts of the anterior-pituitary gland produce insensitivity to insulin, and it is possible that the diabetes associated with hyperpituitarism can be explained by oversecretion of the anterior-pituitary gland The nature of insulin insensitivity in the ordinary case of insulin insensitive diabetes has not been definitely established, and the question as to whether the anterior-pituitary gland plays a dominant rôle in its production is still open

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URETERIC CATHETERISATION IN PYELITIS OF PREGNANCY

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(With Illustrations on Plate)

INFECTION of the urinary tract is a common complication of an otherwise normal pregnancy. This fact is to be anticipated when it is recalled that dilatation of the kidney pelves and ureters, with some degree of urinary stasis, is a normal concomitant of pregnancy.

The association of pyelitis of pregnancy with urinary stasis has been known for many years and since the introduction of intravenous urography has been extensively studied by Baird (1931, 1932), Lee and Mengert (1934), and others. These workers have shown that the upper urinary tract becomes dilated in every pregnancy, the right side being the more dilated in most cases. The dilatation appears to extend upwards from the level of the pelvic brim (figs X and XI on plate). This change is first noticed between the third and fourth months of the pregnancy, becoming maximal at about the sixth to seventh month, a time at which the onset of infection is frequently observed. A great deal of work has been done in an endeavour to elucidate the factors concerned in these changes, but the exact mechanism remains obscure. It appears that the pressure of the enlarging uterus and the hypotonia of the urinary tract, which results from the hormone changes in pregnancy, must be important features.

In a paper read before the section on genito-urinary diseases at the 67th annual session of the American Medical Association in June, 1916, and later published in 1917, Caulk referred to the successful use of the ureteric catheter in what he called "large infected right renal retentions complicating pregnancy." This method of treatment is now well recognised by urologists, and a series of cases reported by Pugh in 1927 is of interest because his patients were treated by long-continued ureteric drainage and no preliminary medication had been tried. It is our experience that the great majority of patients with pyelitis of pregnancy respond to ordinary medical treatment, and we therefore reserve the use of the ureteric catheter for those cases in which, in our opinion, adequate medical treatment has failed

The routine treatment we use for these patients consists in complete rest in bed, the patient being given a light diet with as much fluid as can be taken without discomfort. There seems to be no advantage in forcing fluids in a patient who is already greatly distressed, although the fluid intake should not fall below 4 pints in twenty-four hours. In addition, potassium citrate is given in doses of 1 drachm two-hourly for eight doses, and then four hourly until the patient becomes afebrile Usually this dose is sufficient to make the reaction of the urine alkaline and to maintain it so. The reaction of a freshly passed specimen of urine should be the main guide to the dose of alkali necessary. This is best given in a simple mixture, such as pot. cit., gr. 60; syr. aurantii, ½ fluid drachm; aq ad ½ fluid ounce. It is far less nauseating than the more

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complex mixtures. Occasionally diarrhœa or vomiting may result, but this may be alleviated by the use of the sodium salt or the acetate.

This treatment is usually successful, and failure, if it occurs, is often due to inadequate dosage or the use of a nauseating complex mixture. Very rarely excessive vomiting may make the administration of alkali impossible.

During the four years 1934–37 84 cases of pyelitis of pregnancy were admitted to the London Hospital, and of these only 7 required ureteric drainage—5 on account of failure of alkali therapy and 2 because of excessive vomiting.

TECHNIQUE OF URETERIC CATHETERISATION IN PREGNANCY

In this series of 7 cases nine ureteric catheterisations were carried out and all were done, with a single exception, by one of us (V. W. D.). In one patient (case 6) the second catheterisation was necessary because the first catheter was removed by a nurse when the patient returned to the ward, and in another (case 4) the second catheterisation was performed three and a half months after the first during a recurrence of pyelitis.

In no case was it necessary to use an anæsthetic, but it would be unjustifiable to conclude that catheterisation of the ureter during pregnancy is easy. From the earliest stages the irritability of the bladder makes the patient more intolerant of cystoscopy than usual, and, as pregnancy advances, the alteration in the shape and capacity of the bladder adds to the difficulties, which reach a climax when the head is engaged. When the fœtal head is impacted in the pelvis, the cystoscope is gripped firmly between it and the pubic bone, its freedom of movement is greatly restricted, and any movement is felt with more than ordinary intensity by the patient. It follows that catheterisation of the ureter, particularly in the late stages of pregnancy, should be carried out by the expert only, and it is worthy of note that in one of the cases of this series an unsuccessful attempt at ureteric catheterisation was made several hours before the successful catheterisation. If, therefore, it should ever be necessary for the relatively inexpert to attempt catheterisation in the later stages of pregnancy, an anæsthetic should be given to minimise the difficulties.

When the ureteric orifice has been identified and the catheterisation has begun there should be no difficulty, and the fact that the catheter has reached the renal pelvis will be at once evident from the rapid flow of urine, which is considerably in excess of that from a ureteric catheter of the same size passed into a normal pelvis. In those cases in which there has been a complete block at the pelvi-ureteric junction the flow may be very rapid indeed.

The size of the ureteric catheter passed has no direct bearing on the result, but it is advisable to pass as large a catheter as possible. The sizes used in this series have been 10 and 12. It is of some advantage to use ureteric catheters 10 cm. longer than the standard pattern, in order to have a greater length projecting from the vulva when the upper end of the catheter is in the renal pelvis. Great care must be taken, in withdrawing the cystoscope, to avoid displacement of the catheter. At the end of the operation the catheter is attached to the leg with a piece of adhesive plaster, and the urine is allowed to drain into a bottle.

The catheter was usually left in situ for three or four days. It is our impression, however, that equally good results might be obtained if the catheter remained for twenty-four or forty-eight hours only, although there would perhaps be a slightly increased risk of recurrence when it was removed. It should be removed at once if it ceases to run freely and gentle syringing fails to re-establish the flow.

In this series of cases we have not used therapeutic lavage through the indwelling catheter. The effect of catheterisation and drainage alone was so good that no additional treatment was needed except the continued administration of citrate.

CASE RECORDS

CASE 1.—A primigravida, aged 19, was admitted with eleven days' history of more or less constant pain in the right side of the abdomen. This was severe enough to prevent sleep and was accompanied by attacks of shivering and profuse sweating. There was no frequency or dysuria. There had been no previous kidney disease.

On *examination* she was a pale ill-looking girl. Temperature 101°F., pulse rate 114, respiration rate 24. The uterus was enlarged to the size of a thirty weeks' pregnancy. There was considerable tenderness in the right loin.

Investigations.—The urine contained 1/10 vol. of albumin, the deposit contained many leucocytes,

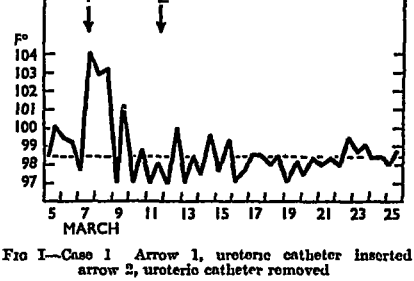

FIG. I.—Case 1. Arrow 1, ureteric catheter inserted, arrow 2, ureteric catheter removed.

occasional red cells, and bacteria, and culture produced paracolon bacilli. A blood count showed 3,600,000 red cells, hæmoglobin 59 per cent., and 17,400 leucocytes (80 per cent. being polymorphonuclears).

Progress in hospital.—Despite alkali therapy for three days her condition became worse. The pain was persistent, and on the third day she had two rigors. On the fourth day a *cystoscopy* was performed and showed that the bladder and ureteric orifices were normal. After the injection of 5 c.cm. of a 0·1 per cent. solution of indigo-carmine intravenously the dye appeared at the left ureteric orifice in four minutes, but none was seen at the right orifice. The right ureter was catheterised, and a very rapid flow of urine resulted, the first blue appearing eight minutes after the injection. There was dramatic relief of pain almost immediately. It is of interest to note that the urine which flowed out was acid, although the bladder urine had been strongly alkaline. The right-kidney urine contained pus and many gram-negative bacilli, and paracolon bacilli were grown on culture. The fever rapidly subsided (fig. 1). The catheter was left in situ for four days, the alkaline therapy being continued during and after this time. The average daily amount of urine from the ureteric catheter was 20 oz. During the same time the average amount of urine passed naturally was 29 oz. daily.

Follow through.—There were no further symptoms, and three months later she was delivered of a healthy child. Three years later she had a second and uncomplicated pregnancy. Two months after the

second confinement she came up for examination. She was completely free from urinary symptoms. The urine was clear, the deposit showed only a few epithelial cells, and a culture was sterile. An excretion pyelogram appeared normal.

CASE 2.—A woman of 23, in her second pregnancy, was admitted with fourteen days' history of pain in the right loin and attacks of shivering and sweating. For four days there had been vomiting and painful frequency. She had had rheumatic fever at the age of 14.

On *examination* she was an ill cyanosed woman. Temperature 102° F., pulse-rate 120, respiration-rate 23. The heart was enlarged, and there was an apical presystolic murmur. The blood-pressure was 120/80. There was no abdominal tenderness. The uterus was enlarged to the size of a twenty-eight weeks' pregnancy.

Investigations.—The urine had a heavy cloud of albumin, the deposit contained many leucocytes, and culture produced *B. coli communis*. The blood-urea was 21 mg. per 100 c.cm.

Progress in hospital.—This patient was treated with alkalis for four days without response. Her condition became more distressed, with right-sided abdominal pain. On the fifth day she was *cystoscoped*, and a normal bladder and normal ureteric orifices were found. After an injection of 5 c.cm. of a 0.4 per cent. solution of indigo-carmine intravenously there was no excretion from either side after eight minutes. The right ureter was catheterised, and there was a good flow of urine, which was acid to litmus. The bladder urine at the time of the examination was alkaline. The right ureteric specimen of urine contained many epithelial cells, pus cells, and bacteria. On culture there was a growth of *B coli*. The catheter was left in situ for three days, and the average daily amounts of urine from the catheter and bladder respectively during this period were 24 oz. and 32 oz. After the removal of the catheter there was complete relief for two or three days, but then for ten days the patient had occasional discomfort on the right side and slight pyrexia, up to 99.6° F. This lasted for ten days and then settled down completely (fig. II).

Follow-through.—There was no recurrence of symptoms, and five weeks later she gave birth to a healthy male child. Two weeks after the confinement the urine still contained pus and grew *B coli* on culture. An excretion pyelogram showed delayed excretion and some residual dilatation of the calyces and pelvis in the right kidney, the left being normal. When she was examined three years later the urine was clear

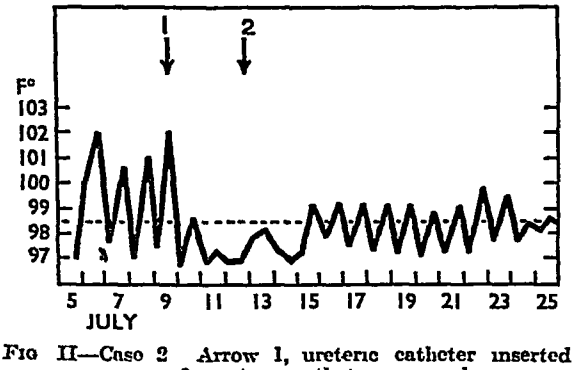

FIG II—Case 2. Arrow 1, ureteric catheter inserted, arrow 2, ureteric catheter removed.

and the pyelogram was normal except for a little rounding of the right upper calyx. There were no urinary symptoms.

CASE 3.—A primigravida, aged 23, was admitted with four days' history of pain in the right loin, gradually getting worse. She had had several shivering attacks and had vomited once. During the four days she had been ill there had been no increased frequency of micturition, although she stated that during the whole of her pregnancy she had had some degree of painless frequency.

On *examination* she was a pale ill-looking woman. Temperature 99.5° F., pulse-rate 112, respiration-rate 32. There was tenderness in the right loin, and the uterus was enlarged to the size of a thirty-six weeks' pregnancy.

Investigations.—The urine contained 1/6 vol. of albumin, there was pus in the deposit, and culture produced *B. coli communis*. A blood-count showed 5,300,000 red cells, hæmoglobin 74 per cent., and 15,000 leucocytes, of which 85.5 per cent. were polymorphonuclears. The blood-urea was 27 mg. per 100 c.cm.

Progress in hospital.—In spite of alkali treatment for five days the symptoms persisted and the temperature remained high. On the sixth day *cystoscopy* was performed and showed a normal bladder and normal ureteric orifices. There was some œdema of the internal meatus, probably due to the pregnancy. The right ureter was catheterised, and there was a very rapid flow of urine. There is no note about the reactions of the bladder and right-kidney urines at the cystoscopy. The ureteric catheter was left in situ for four days. The average daily amounts of urine from the catheter and the bladder during this period were respectively 32 oz. and 38 oz. The symptoms were rapidly relieved, and on the third day after catheterisation the patient was afebrile (fig. III).

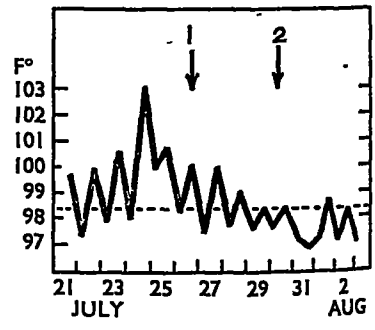

FIG III—Case 3. Arrow 1, ureteric catheter inserted; arrow 2, ureteric catheter removed.

Follow-through.—She remained free from symptoms and on the eighth day after catheterisation was delivered of a live female child. The puerperium was afebrile until she developed a breast abscess. Three months later she was admitted again, complaining of pain in the right loin and frequency of micturition. There were no abnormal physical signs. Excretion and instrumental pyelograms revealed no abnormality. The bladder urine grew *B. coli* on culture but contained no pus. The right ureteric urine was similar, and the left ureteric urine was sterile. We have been unable to trace this patient since her last admission to hospital in 1934.

CASE 4.—A woman of 23, with one child, was admitted with a three days' history of painful and frequent micturition. On the day before admission she had pain in the right loin, which rapidly became more severe.

On *examination* she was an ill-looking woman. Temperature 103° F., pulse-rate 130, respiration-rate 28. There was great tenderness in the right loin, but the kidney could not be palpated. The uterus was enlarged to the size of an eighteen weeks' pregnancy.

Investigations.—The urine was neutral and contained a cloud of albumin, pus and occasional red cells were found in the deposit, and culture produced paracolon bacilli. A blood-count showed 4,700,000 red cells, hæmoglobin 81 per cent., and 17,600 leucocytes, of which 78 per cent. were polymorphonuclears.

Progress in hospital.—She was treated for fourteen days with large doses of potassium citrate without effect. At the end of the first week a greatly enlarged and tender right kidney was palpable. On the four

teenth day *cystoscopy* was performed The bladder and ureteric orifices were normal The right ureter was catheterised, and there was at once a free flow of urine from the catheter The bladder and right

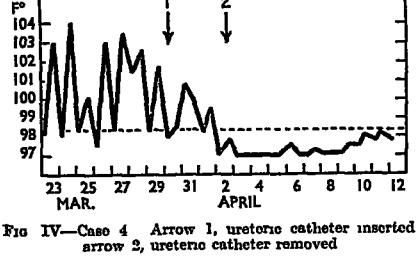

FIG IV—Case 4 Arrow 1, ureteric catheter inserted, arrow 2, ureteric catheter removed

ureteric specimens appeared to be equally alkaline The bacteriological examination showed coliform bacilli to be present in both specimens The catheter was left in situ for three days During this period the average daily amounts of urine from the bladder and catheter respectively were 54 oz and 17 oz The temperature subsided rapidly (fig IV), and the condition of the patient improved She remained free from symptoms and was discharged a fortnight after the ureteric catheterisation

Three months later she was admitted again For four days she had had painful and frequent micturition, pain in the back, and vomiting She was unable to take any medicine owing to the persistent vomiting, and *cystoscopy* was performed on the day after admission Some difficulty was found in introducing the cystoscope owing to the *fœtal head in the pelvis* The right ureter was catheterised, and there was at once a rapid flow of urine from the ureteric catheter The bladder urine contained thick pus and many red cells, and *on culture* there was a growth of paracolon bacilli The ureteric specimen also contained pus and gram-negative bacilli, and paracolon bacilli were grown *on* culture The bladder urine was alkaline, and the ureteric urine was acid The catheter was *left in situ* until the onset of labour on the fourth day after its insertion (fig V) A male child was born after a normal labour lasting ten hours Recovery was uneventful, and the *patient* left hospital on the thirteenth day after labour

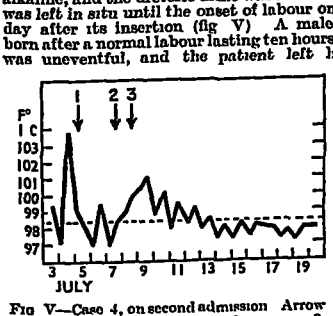

FIG V—Case 4, on second admission Arrow 1, ureteric catheter inserted, arrow 2, ureteric catheter removed, arrow 3, patient delivered

Follow-through—Two and a half years later this patient had a third pregnancy This was normal, and there were no urinary symptoms Three years after treatment in hospital she was well The urine contained no albumin, there was no deposit, and culture grew *Staphylococcus albus* only An excretion pyelogram was normal

CASE 5—A primigravida, aged 21, was admitted with a three weeks' history of pain in the right loin, which had gradually got worse For a week she had had pain on micturition, with some terminal hæmaturia

On *examination* she did not appear to be very ill Temperature 100° F, pulse rate 108, respiration-rate 26 The apex-beat was forcible, and there was a well-marked presystolic thrill and murmur The uterus was enlarged to the size of a twenty weeks' pregnancy, and the right kidney was tender on palpation

Investigations—The urine was alkaline and contained 1/5 vol of albumin, the deposit contained thick pus and many red cells, and culture produced *B coli communis* The blood-urea was 51 mg per 100 c cm A blood-count showed 5,120,000 red cells, hæmoglobin 87 per cent, and 22,800 leucocytes, of which 81 5 per cent were polymorphonuclears

Progress in hospital—She was treated with full doses of alkali but continued to feel ill and had irregular pyrexia Four weeks after admission to hospital *cystoscopy* was performed and revealed a mild cystic trigonitis, without any general cystitis The ureteric orifices were normal The right ureter was catheterised The bladder and ureteric urines were *both neutral to litmus* The bladder and right-kidney urines contained pus, occasional red cells, and bacteria, and on culture grew *B coli communis* The catheter was left in situ for three days, during which period the average daily amount of urine

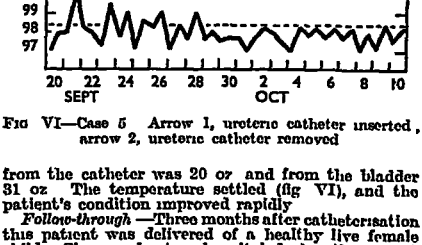

FIG VI—Case 5 Arrow 1, ureteric catheter inserted, arrow 2, ureteric catheter removed

from the catheter was 20 oz and from the bladder 31 oz The temperature settled (fig VI), and the patient's condition improved rapidly

Follow-through—Three months after catheterisation this patient was delivered of a healthy live female child She was kept in hospital during this period because of the condition of her heart Two years later she was well, with the exception of breathlessness due to mitral stenosis and auricular fibrillation A specimen of urine contained no albumin, the deposit showed epithelial cells, and culture yielded *Staphylococcus albus* only An excretion pyelogram was normal (figs XII and XIII on plate)

CASE 6—A primigravida, aged 22, was admitted with six weeks' history of slight headache in the mornings, nausea, backache, and occasional vomiting For two weeks there had been painless frequency of micturition

On *examination* she was a pale ill-looking woman Temperature 99° F, pulse rate 88, respiration rate 21 There was tenderness in the right loin on palpation, but the right kidney could not be felt The uterus was enlarged to the size of a twenty-six weeks' pregnancy

Investigations—The urine was acid and contained a heavy cloud of albumin, the deposit contained many leucocytes and red cells and amorphous urates, and culture produced *B coli communis* The blood-urea was 18 mg per 100 c cm A blood-count showed 2 800,000 red cells, hæmoglobin 51 per cent, and 6800 leucocytes

Progress in hospital—In spite of prolonged alkali treatment the temperature never settled permanently *and the patient's condition did* not improve Six weeks after admission to hospital an attempt was made by one of the surgical first assistants to catheterise the right ureter This was unsuccessful

Four days later *cystoscopy* was again performed. Some difficulty was found in manipulating the cystoscope owing to the presence of the fœtal head. Rapid inspection of bladder showed no obvious changes. The right ureter was catheterised and the specimen obtained was faintly alkaline. The catheter was unfortunately removed in error by a nurse when the patient returned to the ward. The catheterisation was then repeated and the catheter left in situ for four days. The bladder and kidney urines contained pus, red cells, and bacteria, and on culture grew *B. coli communis*. The average daily amount of urine from the ureteric catheter was 17 oz. and from the bladder 42 oz. The temperature fell at once after catheterisation (fig. VII), and the patient's condition improved.

Follow-through.—Eleven days after catheterisation she was delivered of a live male child. This case was complicated by a severe degree of anæmia of pregnancy. Two years later she was well and free from symptoms. She was six months pregnant. A catheter specimen of urine contained a cloud of albumin, there were many leucocytes in the deposit, and *B. coli* grew on culture.

CASE 7.—A primigravida, aged 24, was admitted with two days' history of vomiting followed by pain in the right loin. There was frequency but no pain on micturition.

On *examination* she was a healthy-looking woman. Temperature 102·5° F., pulse-rate 120, respiration-rate 24. There was tenderness in the right loin, and the uterus was enlarged to the size of a thirty weeks' pregnancy.

Investigations.—The urine contained 1/3 vol. of albumin, there was pus in the deposit, and culture produced *B coli communis*.

Progress in hospital.—During the first three days vomiting was excessive, making administration of alkalis impossible. For this reason right-sided ureteric catheterisation was advised. At *cystoscopy* slight general cystitis was found, and the right ureter was catheterised. This procedure was followed by relief of the symptoms in twenty-four hours. The catheter was left in situ for four days (fig. VIII). During the third week in hospital an excretion pyelogram showed a dilatation of the ureters and kidney pelves This was very obvious in the right kidney, in which one or two calyces showed excretion in the 25-min. film

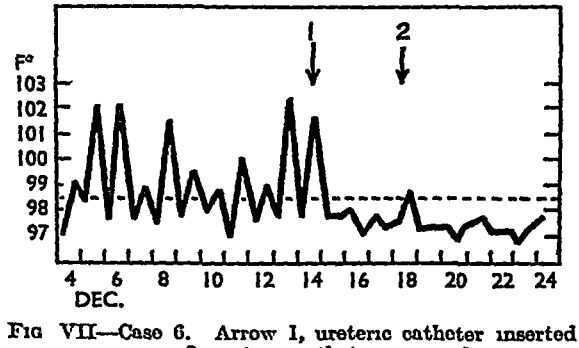

FIG VII—Case 6. Arrow 1, ureteric catheter inserted; arrow 2, ureteric catheter removed.

only. She was discharged free from symptoms after three weeks in hospital.

Follow-through.—A month later she was delivered of a live female child. She was seen again eleven weeks after the confinement. For the first eight weeks there had been some frequency of micturition, but afterwards she had remained free from symptoms. A catheter specimen contained a few leucocytes and epithelial cells and on culture grew *Staphylococcus albus* only. An excretion pyelogram was normal.

COMMENTS

This small series of cases seemed worthy of report because of the excellent response of a grave condition to a procedure which is simple and without risk in the hands of one experienced in catheterising the ureter. It must be emphasised once more that this *treatment is only demanded in rare instances* —i.e., when adequate alkali therapy has failed, as in 5 of our patients, or when excessive vomiting makes

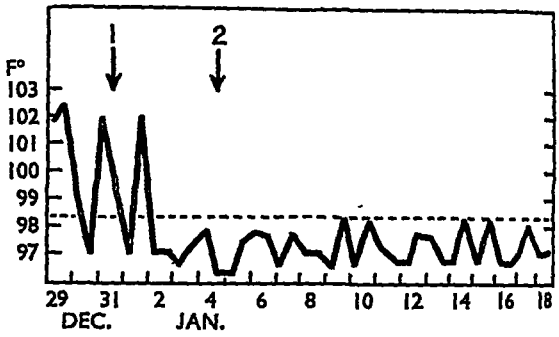

FIG. VIII—Case 7. Arrow 1, ureteric catheter inserted, arrow 2, ureteric catheter removed.

the administration of alkali impossible, as in the remaining 2 cases The obstruction factor seems to be of importance, and it is improbable therefore that any drug would have given relief without the aid of adequate drainage. It must be pointed out, however, that the sulphanilamide group of drugs was not used. Subsequent experience with this group of drugs leads us to doubt whether they would prove of any value in acute cases which fail to respond to alkali therapy, with the possible exception of those in which excessive vomiting is a factor It must be noted that the administration of alkali is continued or resumed after the insertion of the catheter.

An analysis of these cases does not reveal anything differing from the "simple" pyelitis of pregnancy. Of our patients 5 were in their first pregnancy and 2 in their second. The stage of pregnancy at which the symptoms first appeared varied between the eighteenth and thirty-sixth week. The duration of symptoms before admission to hospital varied from two to twenty-one days The right kidney was affected in every instance, and there was tenderness on examination in the right loin. In one patient (case 4) there were two separate attacks, each requiring catheterisation, during the same pregnancy

The accompanying charts show the efficacy of the treatment so clearly that little comment is necessary We wish to record that we always observed a rapid and striking improvement in the general condition of the patient after catheterisation. Premature induction of labour was not required in any of our patients, and it is probable that such a procedure should rarely, if ever, be necessary.

It is of great importance in the later management of patients who have had pyelitis of pregnancy, whether controlled by alkali therapy alone or with the aid of ureteric catheterisation, that the persistence of pus in the urine should not be overlooked. In most instances some degree of pyuria will tend to persist until after parturition. Treatment with mandelic acid may clear up such a residual infection successfully, and it should be given a trial in all cases, preferably two or three weeks after the acute phase has subsided If the pyuria persists throughout the pregnancy, many cases clear up spontaneously after parturition, but, if not, mandelic acid therapy is urgently called for. Calcium mandelate is the preparation which has been most

successful in our hands Failure to treat such residual infections after parturition may result in "subinvolution" of the urinary tract on the affected side, leading to a persistent hydronephrosis and later pyonephrosis, possibly with secondary calculi (fig XIV on plate)

With one exception (case 3) we have seen all these patients again at varying intervals after the attack of pyelitis in which catheterisation was necessary All have remained free from urinary symptoms, and excretion pyelography and examination of the urine have shown no abnormality in 5 of them, although 2 have had subsequent pregnancies The other patient (case 6) was seen at the sixth month of her second pregnancy, two years after the attack of pyelitis, and, although she was free from symptoms, her urine contained many leucocytes and *B coli* was grown on culture

A CASE OF POST PREGNANCY PYELITIS

Although the following case is not one of pyelitis of pregnancy, previous attacks had occurred during pregnancies, and the result of treatment illustrates so well the method we have described that we have included it as an additional case

A woman, aged 20, was first seen by one of us (V W D) on March 11, 1938 Her fourth child had been born two months before, and during the pregnancy she had had no trouble, although during her second pregnancy in 1932, after a miscarriage in 1934, and during her third pregnancy in 1935 she had had severe attacks of pyelitis on the right side When first seen she had an eight days' history of painful and frequent micturition, followed after two days by very severe pain on the right side In spite of intensive treatment with citrate, she continued to have severe pain, and also had several rigors

On *examination* she looked ill Temperature 103·4° F, pulse-rate 96, respiration-rate 22 There was extreme rigidity below the right costal margin and great tenderness on the right side

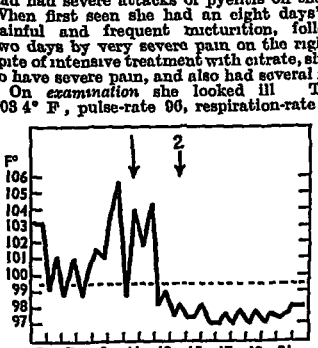

FIG IX—Post pregnancy pyelitis Arrow 1, ureteric catheter inserted, arrow 2, ureteric catheter removed

Cystoscopy showed no general cystitis The trigone was a little red and granular The right ureter was catheterised without difficulty and the catheter was left in Urine from the bladder contained a cloud of albumin, the deposit contained a small amount of pus, and culture produced *B coli* Urine from the right kidney had pus and coliform bacilli in the deposit

Progress.—On the day following catheterisation it was possible to palpate the kidney easily, although it was still slightly tender Twenty-four hours later the temperature had fallen, the kidney was no longer tender, and the patient felt well The catheter was removed on the fourth day, and there was no return of pyrexia (fig IX)

An instrumental pyelogram and an excretion pyelogram, done about a week later, showed dilatation of the right pelvis, with normal calyces and a very much dilated ureter This ureter resembled the ureter seen in cases of subinvolution following pregnancy.

SUMMARY

Seven cases of severe pyelitis of pregnancy, and one of post pregnancy pyelitis, successfully treated by ureteric catheterisation are reported. It is pointed out that this form of treatment is only demanded in those cases which do not respond to ordinary methods of treatment and that careful after treatment is necessary to avoid persistent urinary infection Premature induction of labour should rarely, if ever, be necessary, even in severe pyelitis of pregnancy

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VERTEBRAL FRACTURES COMPLICATING CONVULSION THERAPY

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(With Illustrations on Plate)

MEDUNA, who first introduced convulsion therapy of psychiatric disorders, though he admitted that the treatment was severe, claimed that provided his indications and technique were followed carefully no serious danger was involved, and that considering the poor prognosis of the patients the procedure was thoroughly justified Some authors dismiss the complications in a few lines, referring merely to boils and coryza and temporarily and easily reduced dislocations (Harris 1938) On the other hand, there are now a number of reports of fractures involving the long bones, and in 1938 a case of fractured vertebra was reported by Wespi in Switzerland and another in this country by Stalker

In America it has lately been suggested that in as many as two fifths of patients receiving treatment one or more vertebræ are fractured In April of this year I had the opportunity of visiting the New York State Psychiatric Institute and meeting Dr Nolan Lewis, in whose department much of the work on vertebral fractures was done By that time the news had gone round the eastern seaboard of the United States and as a consequence Cardiazol therapy had been all but completely given up in many of the leading clinics

Since its inception at Woodside in 1937 an increasing number of patients have been given the treatment, and as soon as we learnt of the findings in America we began to get as many of the old patients back for radiography as possible and we radiographed all those remaining in the hospital. This gave us a total of 20 and the very first case examined revealed an almost complete compression fracture of one of the dorsal vertebræ We subsequently discovered a total of 5 cases with fractured vertebræ in the series of 20 cases The incidence here was therefore not so great as the Americans have suggested

Polatin and his colleagues (1939) have excluded the possibility of these fractures existing before

treatment by carrying out routine radiography on all their patients. Nevertheless, it is interesting that in two of the cases in which fractures were found at Woodside there was a history of severe injury One patient had had a severe fall on a ship some years ago, while the second had been involved in a motor accident within the last six months

None of the American authors give any clinical history of the patients with fractures apart from the radiological findings The following is an account of the convulsion in one of our cases

The patient was a man of 26, suffering from schizophrenia. He was given a first injection of 6 c.cm. of a 10 per cent. solution of cardiazol into the right medial basilic vein. He had a rather long aura. Then the fit began with the patient raising himself to a sitting position. His face blanched and he rotated his eyes and head to the right to such an extent as to make one feel that another half inch would result in his dislocating his neck. At the same time he cried out, and then went back slowly into a tonic contraction, working his legs as if he were riding a bicycle. His jaw opened, the gag was inserted and he bit on it firmly, and his arms went into extensor spasm with the wrists pronated. At this moment a snap was heard, which seemed to come from the patient's back about the level of his first dorsal vertebra. He then passed into the clonic phase, after which there was the usual period of apnœa succeeded by stertor. He then gradually emerged from the convulsion. During the fit a nurse was detailed to hold the patient's legs down firmly from the moment that the cycling movements started. No other restraint was applied.

It is important to mention the form of restraint used, as this may be a factor in the production of fractures Other reports do not make clear to what extent patients are restrained, but I have the impression that in America restraint is more generally employed than in this country Actually at Woodside we introduced restraint because we thought it would lessen the likelihood of dislocations and fractures It may be that by so doing we have produced the only fractures which have happened in our series

At Woodside the routine has been to give an initial dose of 5 c cm. of a 10 per cent. solution of cardiazol to all male patients, except to small men where sometimes only 4 c cm. is given; if this does not produce a convulsion a second dose 1 c cm. greater is given five minutes later. It is probable, therefore, that in the majority of cases a fit is produced by a threshold dose In the case described here we wanted to make certain of a fit because the man was not very cooperative, and in the event of failure might have refused further treatment A dose of 6 c cm may have been above this threshold and this may account for the severity of the fit The importance of not exceeding the minimum effective dose has not been much discussed in literature, but excessive dosage seems worthy of consideration as a cause of fractures

RADIOLOGICAL FINDINGS

The majority of spinal fractures recorded have been in the 4th, 5th or 6th dorsal vertebra They are compression fractures and are of all degrees of severity from a severe crush to the slightest chip off the anterior rim, or the radiogram may merely show a thin striate shadow indicating a small crack They resemble the injuries seen in miners, but they are presumably the result of severe muscular action inducing acute flexion of the spinal column It would be of much interest to examine the spines of a series of epileptics radiologically to see whether any of them show vertebral fractures. Dr F. G. Nichols's reports on the radiological findings in our cases were as follows

CASE 1.—The spine shows a compression fracture in the body of the 6th dorsal vertebra. The body shows compression and splaying out in the antero posterior view, and the lines of fracture are apparent. In the lateral view the compression is most pronounced in the anterior part of the body. There is no definite evidence of narrowing of the disks above or below. The rest of the spine shows no indication of injury.

CASE 2.—The appearances here are similar to those in case 1, only they affect both the 4th and 5th dorsal vertebræ. The 4th vertebra shows an angular compression, and the 5th complete telescoping of the body, with extensive narrowing and increased density (figs. I and II on plate).

CASE 3.—The lesion involves both the 4th and 5th dorsal vertebræ, with fractures of the anterior borders reminiscent of the appearance in osteo-arthritis, together with slight compression of the bodies (fig. III on plate).

CASE 4.—There is slight compression of the body of the 5th dorsal vertebra with slight irregularity of the anterior part of its upper border which suggests slight fissuring of the bone in this region

CASE 5.—In the anteroposterior view there is very slight narrowing of the body of the 5th dorsal vertebra. In the lateral view compression of this body is more evident and points to a fracture.

From these X-ray appearances, and from the findings of the American observers, it seems probable that there are three degrees of severity of lesion In the first a slight fracture is produced in the anterior lip of the body, in the second there is a minor degree of compression with striæ showing the lines of fracture; in the third there may be any degree of compression, and this may show itself in the form of an angular flattening of the apex of the triangle in the lateral view or there may be no angular effect, both the A P. and lateral view showing an opera-hat fracture due to general telescoping of the body.

PREVENTION

In seeking a method of avoiding fractures we must try to determine whether they are due to unnecessarily large dosage, to keeping the patient under unnecessary restraint or in an unfavourable position during the fit, or whether they are an unavoidable consequence of the technique at present employed If the third possibility is the true one, we must look for a way of obtaining a full therapeutic effect with more moderate muscular contractions

It is now thought possible that the therapeutic result is due to temporary anoxæmia, and if we succeed in abolishing the muscular spasm of the diaphragm, intercostal muscles, and possibly the glottis either partially or completely, we shall interfere with the production of anoxæmia, and may render the treatment ineffective If we reduce muscular spasm below the level of the nerves supplying the diaphragm we shall not affect the anoxæmia, but we shall prevent all danger of fracture below this level, and may indirectly lessen the likelihood of fractures elsewhere.

We have, therefore, the following plans for consideration First, we may try to influence the whole muscular system, so as to lessen the violence of the contractions during the fit; secondly, we may concentrate on the muscular system below the level of the diaphragm, or, thirdly, we may apply mechanical methods to modify the muscular activity.

Reduction of general muscular contractions could be produced by those drugs which act on the peripheral

neuromuscular mechanism—namely, curare, conine, gelsemium and sparteine If these drugs are used, however, their effect on respiration will have to be kept in mind.

Reduction of muscular contraction below the diaphragm can be produced by spinal anæsthesia, and this procedure has been used by Hamsa and Bennett (1939) From half to one hour before the injection of cardiazol they give a spinal injection between the 1st and 2nd lumbar vertebræ of 10 mg of pontocaine hydrochloride or 100 mg of procaine hydrochloride dissolved in 4 c cm of cerebrospinal fluid. The anæsthesia, with complete sensory and motor paralysis of all thoracic and lumbar segments, wears off about an hour after the convulsion The fit therefore occurs without contraction of the anæsthetised areas These authors support the importance of cerebral anoxæmia, and therefore prolong the period of apnœa by holding the patient's mouth and nose tightly closed for from half to one minute after the tonic spasm is over

Mechanical methods can be of two kinds The patient can either be placed in a position that will minimise the likelihood of fractures, or he can be so fixed by means of apparatus that movements of the vertebræ are impossible Both these methods are based on the assumption that the injury is due to a crush Polatin and his colleagues have tried placing the patient on his side in a position of acute flexion, but they have treated too few patients in this position to assess its effectiveness Bennett and Fitzpatrick (1939) report that they are considering a modification of the curved Bradford frame, to which the patient can be strapped A possible objection to this method is that although it may protect the vertebræ it may result in extensive tearing of muscular insertions along spinal axis They take the view that until the patient can be protected by apparatus or suitable positioning or by some pharmacological method the treatment must necessarily be suspended But it would be most regrettable if we were to throw over a method of such proved value merely because we have encountered this unexpected and difficult complication

SUMMARY

Vertebral fractures during convulsion therapy have been reported in 40 per cent of cases in the United States, and were found in 5 out of 20 cases treated at Woodside Hospital

The degree of restraint applied during the fit and the dosage employed may be factors in the production of fractures

Muscular contractions might be reduced (*a*) by drugs acting on the neuromuscular junctions, such as curare, (*b*) by spinal anæsthesia, or (*c*) by suitable positioning of the patient or the use of fixative apparatus

Convulsion therapy should not be discarded until methods of preventing fractures have been fully explored

I wish to thank Dr Noel Harris, physician in charge, Woodside Hospital for permission to publish these case records, Mr Philip Wiles for useful criticism, and Dr F G Nicholas and Dr J A Hobson for their coöperation

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IMPORTANCE OF BRONCHOSCOPY IN UNRESOLVED PNEUMONIA

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(*With Illustrations on Plate*)

PNEUMONIA as a rule is a self-limiting disease and it commonly terminates by crisis, which may take place any time between the fifth and ninth days—i e, there is an abrupt fall in the temperature and the pulse and respiration rates, accompanied by a marked improvement in the general condition Termination may take place by lysis—i e, the temperature falls gradually for two or three days with a corresponding gradual improvement in the general condition Occasionally there may be a pseudo-crisis followed by a true crisis or lysis After crisis or lysis there is no appreciable change in the physical signs in the lungs for a few days, when gradual resolution in the affected area takes place Redux crepitations appear, and bronchial breathing becomes less intense and is gradually replaced by normal vesicular breath sounds

Occasionally the temperature and/or clinical signs persist and the condition is referred to as delayed resolution, incomplete resolution, unresolved pneumonia, or, by Scadding (1937), circumscribed non-suppurative pneumonia

Within the past two years a considerable number of valuable contributions have been published on pneumonia—particularly in respect to its atypical forms—but in these there has been brief mention of so-called unresolved pneumonia, and, in spite of the term being in almost daily use, published references to the condition are scanty and evasive It has been said that "few cases diagnosed as unresolved pneumonia are strictly entitled to be placed in that category The term is in common use for cases of pneumonia which pursue an atypical course after the first seven or ten days, and for others which have been erroneously considered to be pneumonia" (Holmes 1936), and it is to these incorrectly diagnosed cases that we wish to call attention, particularly to the help that can be afforded by bronchoscopy in forming a diagnosis and instituting treatment

During the past five years we have examined with the bronchoscope 38 patients incorrectly diagnosed as suffering from unresolved pneumonia, 8 of whom were found to be suffering from bronchial carcinoma, 1 from an extrabronchial tumour of unknown pathology, 2 from impacted non radio-opaque foreign body, 5 from bronchiectasis, 1 from inflammatory stenosis of a bronchus, 2 from lung abscess, 1 from enlarged bronchial glands, and 16 children who exhibited varying degrees of incomplete bronchial obstruction apparently caused by secretion It may be assumed, therefore, that cases of so called unresolved pneumonia may be due either to true delayed resolution or to some other intrathoracic lesion which causes symptoms and clinical and/or radiological signs simulating pneumonia

There is no arbitrary period at which a pneumonia becomes an "unresolved" pneumonia, but if a patient suffering from pneumonia exhibits considerable physical or radiological signs of abnormality in the chest four weeks after the onset of symptoms he may be regarded as suffering from either true unresolved pneumonia or some other complication. It has been our experience that in many cases a differential diagnosis between a true unresolved pneumonia and some other lesion can be made only by direct inspection of the bronchial tree, or by the lapse of time, when possibly irremediable damage has been sustained by the lungs.

INCIDENCE AND DURATION

It has been difficult to collect any accurate figures regarding the frequency and duration of unresolved pneumonia; for, as the term is used so loosely, the available records are not truly comprehensive

Hollinger (1938) states that true delayed resolution occurs in about 2–3 per cent. of cases of lobar pneumonia.

Howard (1936) quotes the following observers' findings in regard to the frequency of this complication of pneumonia: Osler and McCrae, 3–4 per cent; Musser and Norris, 4·1 per cent. in 2548 collected cases; McCrae, 3–7 per cent. in 805 collected cases; and Milne reported that he found at autopsy 10 instances of organisation of exudate in 150 fatal cases of pneumonia—i.e., 6 6 per cent. cases of true unresolved pneumonia.

Kohn and Weiner (1936) surveyed a series of 1000 cases of pneumonia in children and report that 800 of these left hospital alive. Of these 800 survivors 318 were discharged with positive physical signs in their chests, and in 421 radiography revealed some degree of infiltration

Jameson (1929), in a follow-up of 200 cases of pneumonia in children, found that 52 were suffering from severe symptoms of recurrent or chronic pulmonary catarrh—including 14 cases of well-marked fibrosis. There is no doubt that the symptoms of unresolved pneumonia are relatively commoner in children than in adults.

With the kind permission of Dr. W. E. Crosbie, medical superintendent, Dr. B. Dodd has analysed the cases of pneumonia treated in Alder Hey Children's

INCIDENCE OF UNRESOLVED PNEUMONIA IN CHILDREN

Year	Lobar pneumonia	Broncho-pneumonia	Total	Cases diagnosed as unresolved pneumonia
1934	566	530	1096	70
1935	541	469	1010	105
1936	570	441	1011	94
Total	1677	1440	3117	269

Hospital, Liverpool, during 1934–36, and an attempt has been made to follow up the patients who were considered to be suffering from unresolved pneumonia. The accompanying table shows the figures obtained. In this series of 3117 cases of pneumonia 269 (8 6 per cent) remained as unresolved pneumonia. Of these 269 cases 75 resolved before discharge from hospital, 5 patients developed empyema, and 6 died. Of the remaining 183 patients only 71 attended for examination, of whom 47 had no signs, 14 had physical but no radiological signs, and 10 had physical and radiological signs. Therefore, excluding the cases not traced, of 157 cases classified as unresolved pneumonia 122 (78 per cent.) had resolved completely and 35 (22 per cent.) still had evidence of some pulmonary lesion. These figures do not include cases originally diagnosed as unresolved pneumonia and in which a later diagnosis of bronchiectasis or lung abscess was made.

The duration of unresolved pneumonia depends on its cause—i.e, whether it is a true unresolved pneumonia or due to some other lesion.

McCrae followed up 40 cases of unresolved pneumonia, and in all of these there was a complete disappearance of signs and symptoms within twelve weeks.

Kohn and Weiner (1936) attempted to keep under observation 800 children who had suffered from pneumonia, but it was possible only to keep in touch with 66 for nine months or more: 30 cases cleared up completely within five months, the fate of 26 cases is not mentioned, and Kohn (1936) reported on the remaining 10 cases watched over a period of ten years.

He gave a favourable report of these, although 1 patient died, 2 cases resolved after some years, 2 patients had collapsed lower lobes (1 with a cavity), 1 had thickened basal pleura, 1 had a shadow at the hilum and suffered from hæmoptysis off and on for eight years, 2 had physical but no radiological signs after two years, and 1 had physical and radiological signs after four years.

These findings are quoted as probably several of these patients at one time or another were considered to be suffering from unresolved pneumonia.

CLINICAL FINDINGS

For the purpose of these notes and to avoid confusion the definition of terms shown in the following table is employed.

LEGENDS TO ILLUSTRATIVE PLATE

MR DIX AND DR. EVANS

FIG. X.—Excretion pyelogram at the 28th week of pregnancy. Normal dilatation of ureters above pelvic brim. The ureters below the pelvic brim were not dilated.

FIG XI.—Excretion pyelogram at the 30th week of pregnancy in a patient who had pyelitis on the right side.

FIG. XII.—Excretion pyelogram on the 13th day after parturition in a patient (case 5) who had had pyelitis.

FIG. XIII.—Excretion pyelogram in the same patient as in fig XII (case 5) two years later, showing return to normal condition.

FIG. XIV.—Excretion pyelogram two years after a pregnancy in which there had been pyelitis on the right side. There was still a urinary infection, and subinvolution of the right ureter is well shown

DR PALMER

FIG. I.—Case 2 Lateral view. Angular compression of 4th and telescoping of 5th dorsal vertebræ.

FIG. II.—Case 2 Anteroposterior view.

FIG. III.—Case 3 Lateral view: Fractures of anterior borders of 4th and 5th dorsal vertebræ.

MR. McGIBBON AND DRS. BAKER-BATES AND MATHER

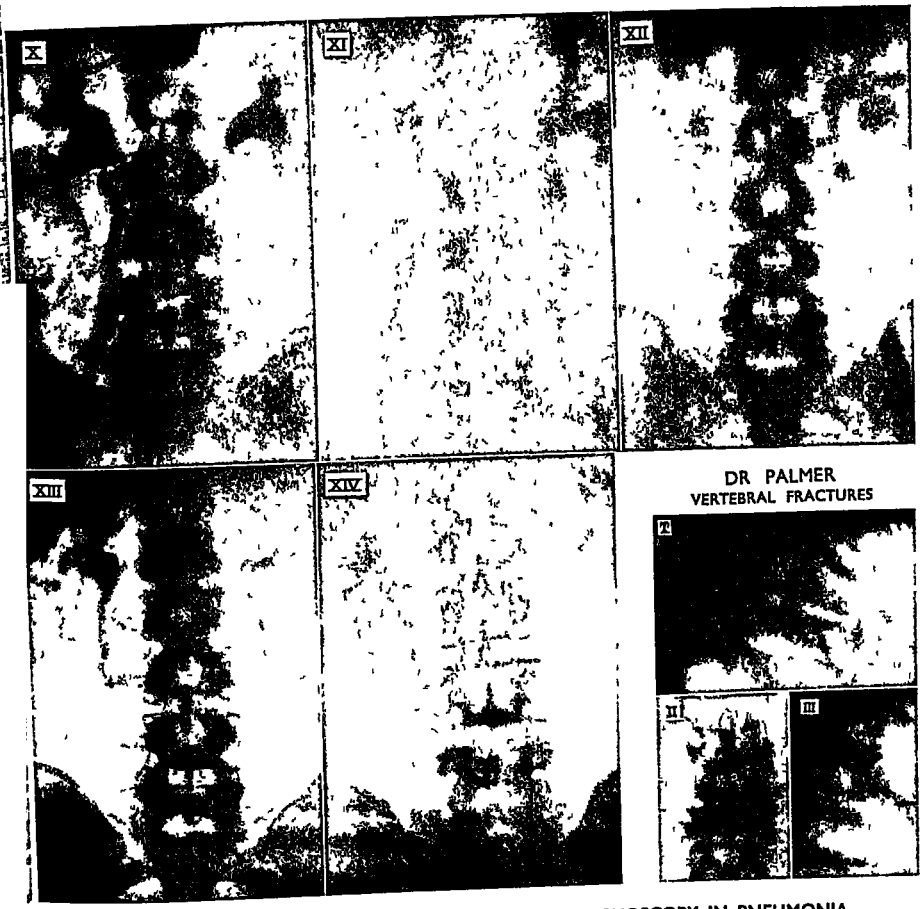
FIG II.—Radiogram typical of incompletely resolved pneumonia

FIG III.—Radiogram of pneumonitis due to impaction of a foreign body, originally diagnosed as unresolved pneumonia

FIG. VI.—Radiogram after lipiodol, showing saccular bronchiectasis in right lower lobe (retouched)

(Figs. III and VI are from the same case as figs. IV, V, and VII in text)

MR DIX AND DR EVANS URETERIC CATHETERISATION



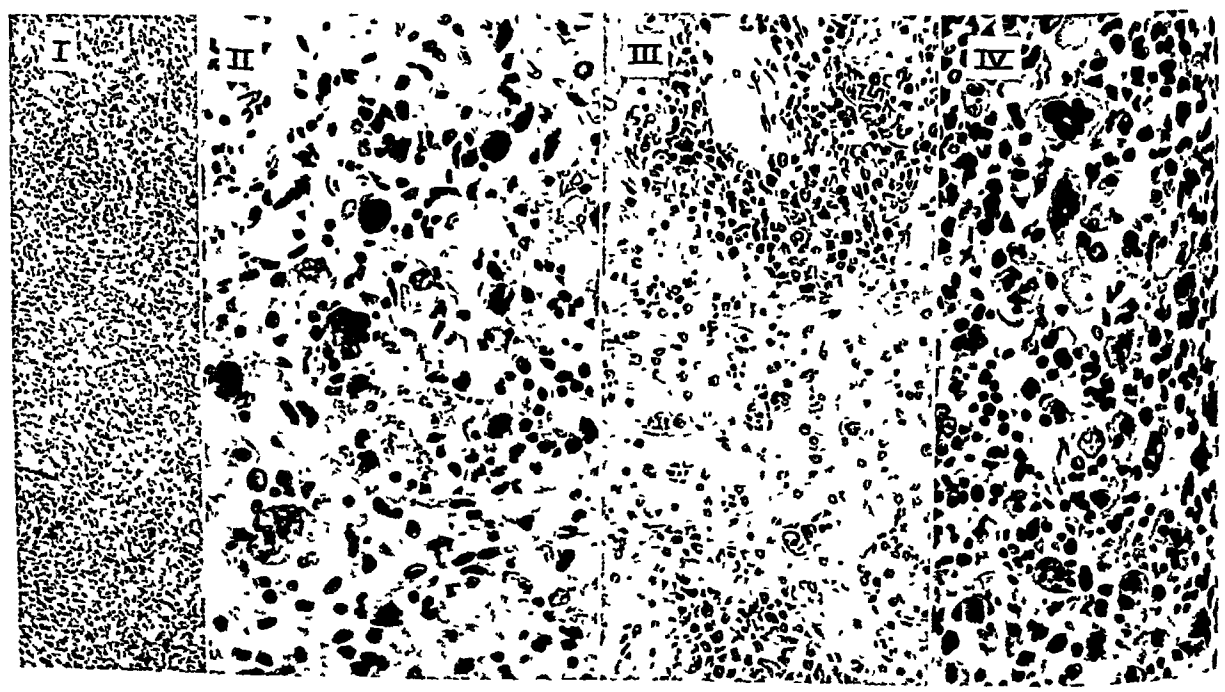
DR PALMER
VERTEBRAL FRACTURES

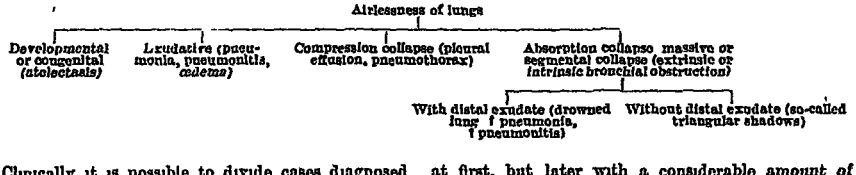
DRS McGIBBON BAKER-BATES AND MATHER BRONCHOSCOPY IN PNEUMONIA

MR TUMARKIN : SURGICAL CONSERVATION OF HEARING

DR VATCHER · ANÆMIA AND ANEURYSM

DRS BODLEY SCOTT AND ROBB SMITH HISTIOCYTIC MEDULLARY RETICULOSIS




Airlessness of lungs
Developmental or congenital (atelectasis)
Exudative (pneumonia, pneumonitis, œdema)
Compression collapse (pleural effusion, pneumothorax)
Absorption collapse massive or segmental collapse (extrinsic or intrinsic bronchial obstruction)
With distal exudate (drowned lung † pneumonia, † pneumonitis)
Without distal exudate (so-called triangular shadows)

Clinically it is possible to divide cases diagnosed as unresolved pneumonia in our series roughly into four groups —

(1) Cases simulating true pneumonia in which the expected crisis or lysis did not take place and constitutional and local signs and symptoms persisted

(2) Cases simulating true pneumonia in which crisis or lysis took place but after a varying interval there was a recrudescence of the general and local signs and symptoms.

(3) Cases simulating true pneumonia which apparently terminated by crisis or lysis but in which local symptoms and signs persisted without any manifest constitutional disturbance

(4) Ambulatory cases presenting themselves with a variety of pulmonary complaints and manifesting local signs and symptoms of unresolved pneumonia without any history of antecedent acute pulmonary disease

In groups 1 and 2 the picture has been that of an acute or subacute respiratory disease with cough, sputum, and evidence of general toxæmia The symptoms depended to some extent on the exact situation of the lesion in relation to surrounding structures When it was situated in or near a main bronchus, irritating cough and hæmoptysis were common symptoms At first the cough was unproductive, but later the sputum became copious and purulent, and its odour varied with the infecting organisms If the lesion was situated near the surface of the lung, pain on breathing was experienced owing to pleural involvement In other cases there was a much more striking general reaction, with high fever and paroxysmal cough, without sputum at first, but later with a considerable amount of sputum streaked with blood and occasionally offensive In groups 3 and 4 the symptoms were those of a mild general toxæmia There were no serious respiratory symptoms or signs on clinical examination, and often the condition was recognised only by radiography of the chest

Clinical examination yielded very divergent results, for the physical signs varied with the situation and size of the lesion Partial suppression of breath sounds, associated with dullness and occasional crepitations, was found as often as bronchial breathing in the early stages of consolidation caused by incomplete bronchial occlusion When the lesion was situated deeply in the lung tissue there were no physical signs, but when the lesion was more superficial there were restriction of movement on the affected side, impairment of the percussion note, bronchial breathing, and crepitations Vocal vibration was usually increased, and the voice sounds were bronchial Sometimes the breath sounds were absent and the distinction between consolidation, pleural effusion, and collapse was very difficult to make by clinical examination, for there was usually no displacement of the heart unless there was frank lobar collapse The important physical sign was the absence of breath sounds, for as a rule there were no added sounds, although crepitations and rhonchi were sometimes heard It is essential, therefore, to ascertain if there is deficient entry of air into the affected area of lung, such a discovery arising late in the course of a pneumonia should lead to a reconsideration of the diagnosis

The sputum was always examined for tubercle bacilli as a routine measure on three occasions at least during the acute phase, and the examination was repeated if the clinical course did not go as expected, Empyema was anticipated and excluded by radiography, and any suspected area was explored with a needle

The cases in this series which presented the greatest diagnostic difficulties on clinical and radiological examination were those with incomplete collapse, especially when the lesion was retrocardiac Cases conform to the classical description of lobar pneumonia less often than formerly, hence it has been said by the older clinicians that the type of pneumonia has changed The physical signs of many of the atypical pneumonias are so alike as to render differentiation at the bedside virtually impossible Hitherto radiography has afforded the main distinguishing features, and attempts to classify these similar clinical states of varying ætiology have been almost all radiological But, although radiography has clarified the pathology of many pulmonary conditions the findings should not be regarded as final They are only to be considered in conjunction with all other aspects of the case and not to the exclusion of further methods of examination

In this respect so-called "primary" pneumonitis (Gill 1938) is so far merely a radiological conception and is probably due, as Beaumont (Gill 1938) has

LEGENDS TO ILLUSTRATIVE PLATE

MR TUMARKIN

FIG IIa—Pneumatised mastoid showing "soap bubble" appearance due to widely ramifying *galleries of air cells*

FIG IIb—Diploetic mastoid, showing very few air cells

FIG IIc—Compact mastoid Solid mass of bone showing no air cells whatsoever

DR VATCHER

FIG I—Abdominal aneurysm, anteroposterior view

FIG II—Abdominal aneurysm, lateral view

DRS BODLEY SCOTT AND ROBB SMITH

FIG I—Spleen (× 76) The normal architecture is maintained but the medulla is congested and contains numerous prohistiocyte giant cells

FIG II—Spleen (× 300) Numerous prohistiocytes are to be seen some of which are giant forms, there is one giant cell of the Reed Sternberg type in a venous sinus Many histiocytes showing ingested erythrocytes are present

FIG III—Liver (× 180) showing proliferation of prohistiocytes in the periportal tissue and of Kupffer cells in the sinusoids

FIG IV—Bone marrow (× 300) showing the proliferation of prohistiocytes and histiocytes, many of the latter containing ingested erythrocytes

suggested, to a partial obstruction of the bronchioles with mucopurulent exudate, but its pathology meanwhile is conjectural. It appears to us to correspond to the benign form of pneumonia which sometimes occurs after removal of tonsils; for, as Burrell (1938) has pointed out, the word "pneumonitis" has the same meaning as pneumonia—namely, an inflammation in the lung. Maxwell (1938), in a more recent paper, has emphasised the importance of the recognition of primary pneumonitis as a separate clinical entity and suggests that the term should be confined to cases with good local and general resistance in which the disease runs a benign course.

"Secondary" pneumonitis (Gill 1938) or "secondary" pneumonia (Burrell 1938) is a definite entity and is the local reaction of the lung in response to one of many ætiological factors, usually a low-grade inflammation affecting the alveoli and associated with exudation. A photomicrograph of "secondary" pneumonitis is reproduced in fig. I from a case of inhaled foreign body, and it shows the similarity of the histological picture to that of pneumonia.

A similar criticism can be applied to the clinical term "damaged lung," which was originally introduced by Riviere (1923), and round which the literature has grown to such an extent that the term "damaged lung" is recognised more or less as a diagnosis. Such terms are generalisations and give no hint of the exact causation or pathology of the lesion.

RADIOLOGICAL OBSERVATIONS

In resolving pneumonia radiography shows mottled shadowing in one or more lobes, occasionally accompanied by enlarged root-shadows on the affected side, but without any appreciable collapse of the lung (fig II on plate) It is advisable, whenever possible, to radiograph every patient recovering from pneumonia; and, if the symptoms or clinical signs persist, the patient must be radiographed again after an interval of seven to ten days When the shadowing shows no change or has increased, some other lesion should be suspected and further methods of examination should be instituted without delay. If only a single radiological examination is carried out, it is impossible to distinguish between a resolving pneumonia, a true unresolved pneumonia, or pneumonitis secondary to incomplete bronchial stenosis (caused by secretion, non-opaque foreign body, or simple or malignant new growth) The X-ray appearances of resolving pneumonia may be simulated by pulmonary tuberculosis, epituberculosis, and occasionally by bronchiectasis, but in the last condition there is usually some evidence pointing to collapse of the lobe involved—as mentioned earlier, collapse is not a feature of resolving pneumonia.

FIG I—Photomicrograph of lung in pneumonitis due to impaction of a foreign body

PATHOLOGICAL CONSIDERATIONS

In our series of cases the pathology has been that of interference with bronchial drainage, associated with secondary changes distal to the obstruction. Plugs of secretion, foreign bodies, bronchial stenosis, neoplasm, and pressure of tumours from without have caused the obstruction. All grades of secondary lesions have been found, and these secondary manifestations have varied with the rapidity and cause of the obstruction and with the virulence of the organisms present. The clinical signs and symptoms and the immediate gravity of the illness have depended on the secondary complications, which as a rule completely overshadowed and obscured the primary cause Rapid obstruction produced partial collapse, which was either lobar or segmental, according to the size of the obstructed bronchus; or, if segmental, neighbouring affected segments became confluent with lobar collapse. If the obstruction took place more slowly, so-called "drowned lung" was brought about.

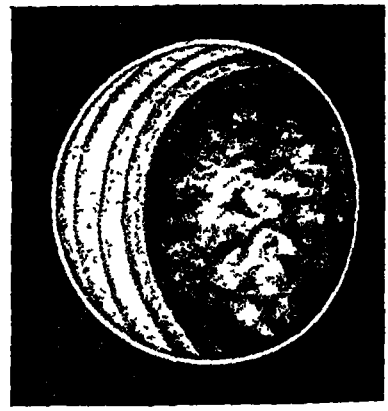


FIG IV—Granulation-tissue filling right lower bronchus, as seen on bronchoscopy (same case as figs. III and VI on plate).

CAUSES OF OBSTRUCTION

Viscid secretion was the commonest cause of bronchial obstruction in our series—18 cases out of 38—and the obstruction was usually in the bronchi of the middle or lower lobes. Although bronchial obstruction due to retained secretion was described as an entity nearly a hundred years ago (Thomas 1938), interest in it did not revive until Pasteur (1908) published his papers on pulmonary collapse sixty years later. The latter, however, did not consider that bronchial obstruction due to secretion was the cause of collapse, and it is only within the past ten years that the frequency of secretion as an obstructing agent, its easy removal, and the gratifying results thereby obtained have become generally recognised The rôle of secretion as an obstructive agent has been emphasised, among others, by the following workers

Lee and Tucker (1928) showed experimentally that "massive collapse" was due to bronchial obstruction by secretion, and in conjunction with Ravdin and Pendergrass (1928) they produced collapse of the lungs in dogs by inserting into their bronchi plugs of mucus which had been obtained from those of human patients

Coryllos and Birnbaum (1933) drew attention to the importance of secretion as a cause of bronchial obstruction and noted the extreme viscosity of pneumococcal sputum, which contains fibrin and coagulates very rapidly They went so far as to define lobar pneumonia as a complication of a pneumococcal bronchitis, caused by bronchial obstruction by exudate infected with virulent pneumococci.

Burrell (1938) also suggested that pneumonia might be caused by plugs of secretion in the bronchi Gunn (1938) has described the difficulty of infecting laboratory animals by merely spraying broth cultures of pneumococci into the bronchi, whereas, if virulent cultures mixed with mucus, sterile mucin, or viscus starch-paste were injected well down into the bronchi, pneumonia resulted in almost all the cases

Clinical support of this theory of the pathology of pneumonia is borne out by the observations of Corylios (1920), who aspirated bronchoscopically 9 cases of pneumonia with beneficial results Tallerman and Jupe (1929) and other observers have described mediastinal shift to the affected side sometimes seen radiologically in the early stages of the disease

Erwin and McGill (1938) observed 2 cases of pneumonia with definite clinical signs of a blocked bronchus, and Telling and Oliver (1938) have recorded notes of a case of pneumonia with massive collapse These last observers point out that complete collapse of a single lobe in lobar pneumonia is commoner than is supposed, and they refer to reports of 62 cases with complete lobar collapse and 10 cases with massive collapse of the whole lung

Anspach (1934) described 50 cases of pulmonary collapse in children, of which he had investigated all clinically and radiologically and several at autopsy In the latter he found thick tenacious exudate filling the smaller bronchi De Brun and Gerlings (1936) also have published a very full description of collapse of the lung in children due to occlusive secretion and Maxwell (1937) has described massive collapse of the lung in patients with bronchitis and asthma—one patient was cured by bronchoscopic aspiration of secretion, another coughed up a large plug of mucus with complete relief from symptoms, and the third was cured by breathing exercises

That this type of bronchial obstruction is common in children is explained by the small lumen of their bronchi, feeble cough, and disproportionately small larynx, which hamper removal of secretion, and it can be appreciated readily that a very slight degree of mucosal swelling of the small bronchial divisions of a child will contribute considerably towards any obstruction Incomplete collapse of a large part of a lung can occur therefore in young children from very slight causes, and so, when signs of consolidation are found in a young child, the above mentioned possibilities must be considered

FIG VII—Same case Photograph of bronchiectatic lung removed by lobectomy

It is now recognised that this kind of obstruction is a precursor of bronchiectasis, and that the permanence and extent of the damage brought about is proportional to the length of time the bronchus remains occluded We have observed the supervention of undoubted bronchiectasis within a few weeks, Warner and Graham (1933) have reported the development of this complication within six weeks of bronchial obstruction, Boyd (1935) within fourteen days, de Brun and Gerlings (1936) within seven weeks, and Hollinger (1938), in a description of 3 cases of so-called unresolved pneumonia due to bronchial obstruction by plugs of secretion, saw bronchiectasis become manifest in two months

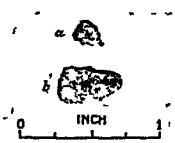


FIG V—Same case Photograph of two pieces of bone (life size) removed from left lower bronchus

A collapsed lobe with its relaxed bronchi may simulate bronchiectasis by contrast radiography with apparent *recovery from the condition* on re expansion of the lobe, as has been pointed out by Chandler (1937), but there is no doubt that recovery may take place in early cases of true bronchiectasis, after restoration of the patency of the bronchus We have seen this take place, Findlay (1935) drew attention to it when discussing bronchiectasis in children, and Jennings (1937) has reported a case which recovered

Inhaled foreign bodies which are radiologically non opaque were found in 2 of our cases and gave rise to the picture of so called unresolved pneumonia, owing to the partial bronchial obstruction produced with secondary pneumonitis and pulmonary suppuration It is our impression that the entrance of foreign bodies into the bronchi is not so rare as current teaching would have us believe The effects of a foreign body in the tracheobronchial tree are sufficiently well known and do not need elaboration The obvious cases are dealt with promptly by the laryngologist, but it is in the obscure cases presenting only signs of pulmonary infection that the true cause is overlooked It might be supposed that the entry of a foreign body into a bronchus could hardly escape notice. This, however, is by no means true; and, if death does not quickly supervene from pneumonia or gangrene of the lung, the patients may seek advice because of symptoms suggesting the presence of some lesion in the chest, which is in reality secondary to bronchial obstruction, by a foreign body As a general rule the lower down the respiratory tract the foreign body goes, the less the irritation and distress at the time, although this depends also on the nature and mobility of the inhaled object

The early result caused by the foreign body may be either obstructive emphysema or collapse of part or the whole of the lung These conditions should be readily recognised clinically and on radiography If, however, the bronchus is not completely occluded, a secondary pneumonitis will develop which eventually may be regarded as an unresolved pneumonia *Later changes are those due to suppuration* of the lung—bronchiectasis, abscess, and gangrene One case from our series is described below and is illustrated serially in figs III and VI on plate and IV, V, and VII in text

On Dec 23, 1936, a woman of 30 complained of cough and expectoration of seven months' duration with recurrent "influenzal" attacks Some limitation of movement and crepitations at the right base were evident On the 29th radiography showed that "appearances point to consolidation—probably unresolved pneumonia of right middle and lower lobes No evidence of tuberculosis" (fig III on plate) On Jan 25, 1937, radiography after Lipiodol showed "normal lipiodol" On the 26th bronchoscopy revealed a mass of granulation tissue

filling the right lower bronchus (fig. IV), from which a small piece of bone was removed (fig. V).

The patient's symptoms became more severe. There was much cough with copious mucopurulent sputum, and clubbing of her fingers developed. On May 31, 1937, bronchoscopy showed the granulations still present, and a second and larger piece of bone was removed (fig. V). Subsequently her general condition improved, but the cough persisted with purulent expectoration and occasional hæmoptysis. On Dec 20, 1937, bronchoscopy showed that the granulations had entirely disappeared from the right lower bronchus, but pus was welling up from the basic bronchi. On the 21st radiography after lipiodol showed "saccular bronchiectasis of right lower lobe" (fig. VI on plate). On March 9, 1938, lobectomy was performed by Mr. J. T. Morrison (fig. VII). The patient made a good recovery and has remained well since.

Incomplete bronchial stenosis was found in 1 case. Bronchostenosis is considered to be almost always secondary to impaction of a foreign body, although we consider that we have examined at least one patient in whom a congenital bronchostenosis was present with a small localised distal bronchiectasis. Hollinger (1938) has described a case of so-called unresolved pneumonia which exhibited bronchial stenosis, and Davidson and Freedman (1933) have reported stenosis of the left main bronchus in a woman, aged 43, who gave a history of acute lung disease 25 years previously. Our case was that of a child with stenosis of the right lower bronchus after inflammation.

Bronchial neoplasm is a common cause of bronchial obstruction, and, as Burrell (1938) has pointed out, "the first manifestation may be an acute illness called, and rightly called, pneumonia" In the early stages of bronchial carcinoma there may be no physical or radiological signs of disease. This has been emphasised by two of us in a recent paper (McGibbon and Baker-Bates 1937). Sooner or later, however, bronchial occlusion, transient or permanent, takes place, and some degree of secondary pneumonitis or pulmonary suppuration always occurs distal to the block This accounts for the diagnosis of unresolved pneumonia which may be made radiologically in the early phases of the disease There were 8 cases of bronchial carcinoma incorrectly diagnosed as unresolved pneumonia in our series

Pressure from without the bronchus may be due to many causes, but in our series it has been due to neoplasm or to tuberculous glands Anspach (1934) has described bronchial obstruction caused by cardiac enlargement and has suggested that it might occur also in Pott's disease or aortic aneurysm Brook, Cann, and Dickinson (1937) also have described cases due to pressure exerted by tuberculous glands Such pressure from without produces partial or complete bronchial obstruction, and the end-results are similar to those due to intrinsic causes

PROGNOSIS

The prognosis in our series nearly always has been serious, but it varied from case to case, and no general rules can be laid down. No patient suffering from unresolved pneumonia with stationary clinical or radiological signs should be treated expectantly; bronchoscopy should be undertaken, for irremediable damage may otherwise take place Although the lung is normally one of the best-drained organs in the body, once bronchial obstruction develops it is one of the worst drained, and it has been shown repeatedly that obstruction, complete or incomplete, leads to either pulmonary suppuration—abscess or gangrene—or collapse with an associated bronchiectasis. It is of paramount importance, therefore, to attempt removal of any bronchial obstruction, from whatever cause, at the earliest opportunity, to restore the patency of the bronchus and re-aeration of the lung before these secondary effects supervene.

SUMMARY

(1) A series of cases is reviewed in which the clinical and radiological features suggested unresolved pneumonia but the common lesion was bronchial obstruction

(2) The importance of early bronchoscopy in conjunction with other methods of investigation is emphasised

(3) The causes of obstruction were plugs of secretion, foreign bodies, bronchial stenosis, new growths, and extrabronchial pressure

(4) The common secondary results of bronchial obstruction are pneumonitis, collapse, bronchiectasis, lung abscess, and gangrene. These may be associated with various diseases of the lung or bronchi, and it is important to realise that they are due to other pathological conditions; they should not be regarded as independent diseases

(5) All patients who have had pneumonia and have any symptoms three or four weeks after the onset should be radiographed If a diagnosis of unresolved pneumonia, resolving pneumonia, delayed resolution, or incompletely resolved pneumonia is made, radiography should be repeated after ten to fourteen days If there is then no appreciable change, or if the radiological signs are more obvious, broncho scopy should be carried out without delay.

(6) Ambulatory cases—group 4 in our series—presenting radiological signs should be radiographed again and treated in a similar manner.

(7) It is only after taking serial radiograms that the radiologist can be dogmatic about the diagnosis of true resolving pneumonia

(8) The cases which are diagnosed radiologically as "unresolved" or "resolving" pneumonia are those in which there is partial bronchial stenosis with secondary changes distal to it. If there is complete stenosis, there will be evidence of segmental or lobar collapse, which will produce an entirely different radiogram from those in unresolved pneumonia.

(9) The age of the patient must be considered when a diagnosis is sought In children and young adults true unresolved pneumonia and incomplete bronchial obstruction due to secretion or foreign body are the common causes of symptoms and signs. In adults bronchial carcinoma is the commonest finding

(10) In the cases described above the pathological changes have been secondary to partial bronchial occlusion, and true pneumonia also may be due to bronchial obstruction. The pathological states found in unresolved pneumonia and true pneumonia may thus be produced by similar mechanical means, and the end-results may differ only inasmuch as the obstructing agents vary.

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SURGICAL CONSERVATION OF HEARING

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(With Illustrations on Plate)

It has been well said that chronic aural suppuration is a reproach to medical science Organised coöperation between otologist, medical practitioner, and medical officer of health will undoubtedly abolish this menacing disease someday Until that day arrives, however, otologists will continue to find most of their time taken up with "chronic ears" The treatment of chronic aural suppuration has a twofold purpose—namely, to preserve hearing and to preserve life, but unfortunately the surgeon is not always able to reconcile the conflicting demands made on him Of course, in a considerable proportion of cases, conservative treatment will cure the inflammation, and so remove at one stroke both the threat to hearing and the threat to life *

It is in the remaining cases that the surgeon must make the difficult decision whether to operate or not Only too often in his anxiety to avert any potential intracranial complications the surgeon is tempted to sacrifice the hearing quite ruthlessly It has been maintained that in certain cases the radical mastoid operation improves hearing This is true, but only of patients whose hearing was grossly impaired beforehand Even so, the improvement is rarely such as to make the ear a really useful one

Certainly in the type of case which I describe below as chronic perforating epitympanitis, in which the hearing is good beforehand, the classical mastoidectomy will have a disastrous effect on hearing An American authority writes, 'Chronic suppurative otitis media usually begins in childhood When prolonged into adult life, permanent deafness always results, and operations are then of little or no value in restoration of hearing" (Fowler 1937)

If this gloomy account were accepted as comprehensive and final, we should have to admit that surgery has little or no place in the conservation of hearing I hope to show in this article that the position is quite different We can hold out to many of these sufferers a promise of arresting that inexorable descent into the hell of deafness, and indeed can often restore hearing which apparently had been permanently lost I include, for instance, in my present list several patients who hear now better than they have done since childhood One man indeed now depends for his livelihood on an ear which for twenty years he regarded as useless

The fact is that the classical radical mastoidectomy was designed to deal with pan otitis—a pathological entity which emerged so to speak with the dawn of otology Chronic otorrhœa as we see it today is rarely due to pan otitis, it is due to chronic epitympanitis, for which, as I have already said, the classical operation is a disastrous mistake

Let us recall the surgical anatomy of the ear We may regard the middle ear as a box of which the wall facing us is partly constituted by the tympanic membrane (fig I) It is vital for the present argument to remember that the upper part of this wall is bone

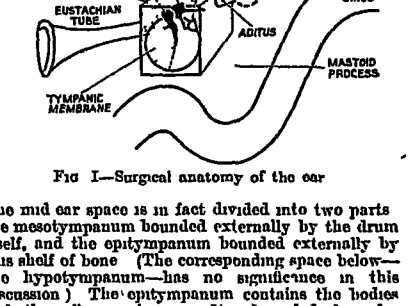

FIG I—Surgical anatomy of the ear

The mid ear space is in fact divided into two parts the mesotympanum bounded externally by the drum itself, and the epitympanum bounded externally by this shelf of bone (The corresponding space below—the hypotympanum—has no significance in this discussion) The epitympanum contains the bodies of both malleus and incus It is bounded above by the tegmen tympani separating it from the meninges, but posteriorly it communicates by a narrow corridor—the aditus—with the mastoid antrum The latter is a comparatively large cavity in the body of the mastoid bone, while radiating from it in all directions are galleries of air cells giving the typical pneumatised appearance seen in fig IIa on plate

PAN OTITIS AND PERFORATING EPITYMPANITIS

In pan otitis any or all of the following conditions may be found

(1) The drum is perforated and may indeed be completely destroyed

(2) Polyps or masses of exuberant granulation tissue spring from patches of unhealthy bone

(3) The ossicles may be carious, and in some cases completely destroyed

(4) The mastoid antrum and adjoining air cells may be occupied by unhealthy tissue or mucopurulent discharge

(5) Fistulæ may erode into adjacent vital structures—the brain, lateral sinus, labyrinth, facial nerve, and so on

This type of advanced pan otitis was comparatively common years ago, and the earlier otologists quite rightly dealt with it by means of the radical mastoid operation This aimed at eradicating all unhealthy tissue, and by converting the whole space into a single cavity it ensured adequate drainage, so averting the dreaded intracranial complications

* In a small proportion of cases curing the suppuration temporarily diminishes hearing This can by no means be regarded as justification for neglecting the discharging ear Such cases are the exception and furthermore the suppurating ear will surely deteriorate more rapidly than the dry ear so that the end result is invariably worse in untreated cases

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Within recent years, the picture presented by chronic otorrhœa has changed considerably. Widespread adoption of preventive measures and the all-round improvement in conservative lines of treatment have almost abolished the type of "chronic ear" described above. This subsidence of chronic pan-otitis however has allowed a totally different type of infected ear to emerge and assume its proper importance I refer to chronic perforating epitympanitis This condition presents the following remarkable features.

(1) The tympanic membrane may be intact except for a tiny perforation in Shrapnell's membrane or in the post superior quadrant (fig. III). Usually this perforation is occupied (see fig. IV) by a polyp which arises from the diseased area in the attic.

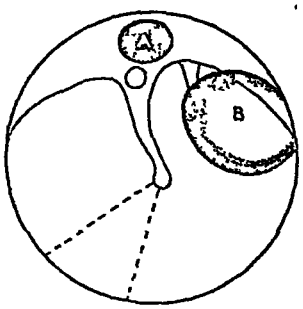

FIG III—Tympanic membrane showing typical situations of perforations in chronic epitympanitis A, in Shrapnell's membrane, B, in posterior superior quadrant.

(2) The ossicles may be quite healthy even in cases of twenty years' standing

(3) The structure of the mastoid bone is quite different from the pneumatised type of fig. IIa. Usually there are no air cells whatsoever, and the bone is diploetic just like any other cranial bone (fig. IIb on plate) or it is a solid mass of compact bone (fig. IIc on plate). This fact is of vital importance to the present argument. It is true that long-standing suppuration in the centre of such a bone can produce osteosclerosis, caries, and even massive necrosis; nevertheless, in the great majority of cases none of these occurs. Such a mastoid bone, like the ossicles and the main part of the tympanic membrane, is quite capable of remaining healthy during ten or twenty years of otorrhœa.

(4) Because of the above factors the hearing is often remarkably good.

(5) Despite its apparently benign features, this condition resists most obstinately the standard conservative measures mainly because the minute perforation effectively prevents the application of dressings to the inflamed lining of the epitympanum.

(6) In those unfortunate cases in which extension to adjacent structures does take place, the process is liable to advance so insidiously that almost the first warnings of its presence may be a fulminating meningitis or sinus thrombosis.

These essential peculiarities of this epitympanitis have never really received adequate recognition, and many surgeons still adhere to the deplorable practice of exenterating the delicate (and often quite healthy) middle-ear structures in their routine performance of radical mastoidectomies for intractable otorrhœa. Obviously in such cases there will be a marked depreciation in hearing. Dan McKenzie (1931), referring to this problem and its solution, wrote:

"Treatment is suggested, namely, in the case of disease limited to this small area and not getting well to remove the thin plate of bone by punch forceps from the meatus so as to provide free exit for the contained debris. As the cholesteatomatous lining may be left in situ, if other symptoms which indicate wider infection are absent, the mastoid route of access is unnecessary. Consideration of this aspect of our subject, however, raises a wider question. In the past when dealing with cholesteatoma the attention of the surgeon has been focused upon the supposed cause of the cholesteatoma, the suppuration of the middle ear, and his efforts have been applied to getting rid of this disease. But, as we have shown, middle-ear disease may be entirely absent. How many hearing ears have been destroyed by this misconception?"

Let us recall that the mesotympanic structures are healthy—i e, drum and ossicles. The mastoid bone itself is healthy. All we have really to deal with is the focus in the epitympanum, and even this is usually a mere mucosal infection, rather than a true osteitis In fig. IV I have drawn a longitudinal section of the ear, showing this focus of infection, inadequately draining through a small perforation in Shrapnell's membrane The perforation, in addition, is blocked by a polyp. The solution to our problem becomes obvious at once As McKenzie said, all we need do is provide drainage by removing the "plate of bone"—i e, the outer wall of the attic.

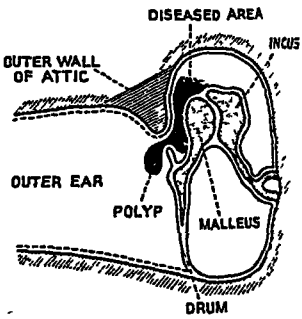

FIG IV—Chronic epitympanitis showing how removal of the outer attic wall affords room for drainage and the application of medicaments to the diseased area in the epitympanum.

TRANSMEATAL ATTICOTOMY

Why then did no one carry out the operation? Presumably because surgeons were fixed in their habit of approaching the middle-ear structures via the mastoid. They did in fact compromise by inventing the transmastoid atticotomy. In this latter operation the mastoid is opened and exenterated solely as a means of approaching and draining the epitympanum The ossicles and drum, wherever possible, are left intact. Admittedly a step in the right direction, this operation still has many disadvantages in comparison with the transmeatal approach. We may note the following.

It entails a postaural incision with its sutures, ligatures, possible stitch abscesses, and so on.

It produces a large raw bone cavity inadequately lined by skin flaps which are only too liable to become gangrenous. In contrast with this the meatal operation leaves intact the mucosal lining of the bone which, although chronically inflamed, is quite capable of healing perfectly if properly drained. There is adequate healthy skin to cover the small raw edge of bone. In some cases the final result is amazing; it would be impossible to recognise that an operation had been performed.

There is no comparison between the magnitude of the two operations. The one is a major operation lasting 1–1½ hours under a general anæsthetic and entailing two or three weeks in hospital; the other is a minor procedure usually performed under a local anæsthesia and lasting about 30 min. The patient is out of bed the next day and can leave hospital immediately, though I usually keep him in under observation for two or three days.

The reader may well inquire what compensating disadvantages must otologists have visualised. What difficulties, imaginary or real, deterred a generation of surgeons from attempting this operation? The question is partly answered by the following opinion of a well-known American surgeon (Shambaugh 1937)

"This operation, similar to ossiculectomy with removal of the outer attic wall through the meatus, has the same disadvantages: limited visibility,

limited accessibility and therefore increased danger of facial-nerve injury or stapes luxation. The post-aural route has no disadvantages to compare with the increased hazard of the canal route."

My answer to this is an emphatic denial. Admittedly the operation is not one for the casual otologist, but neither is any other procedure that aims not only at curing the disease but also at conserving the hearing. In conscientious and careful hands transmeatal atticotomy can be performed with the precision of a watchmaker. The ossicles, drum, and the region of the semicircular canal and facial nerve are under close supervision all the time and the clear cut bloodless field (produced by local anæsthesia) permits delicate manipulations which would be quite impossible in the blood-filled depths of an ordinary mastoidectomy cavity. On the Continent, and, I believe, in Russia, the operation is gradually gaining recognition, having been advocated by a small band of enthusiasts for some years (Kecht 1936, Thies 1933, and Trampnau 1936).

It is not possible in an article of general interest to discuss details of technique. Suffice to say that under local anæsthesia a small skin flap is turned down from the deep part of the osseous meatus just where it abuts on the post-superior quadrant of the drum. The bone thus exposed is none other than the outer wall of the attic. It is carefully chiselled away and then the skin flap replaced and tucked down over the raw bone edge. No dressings are required but the usual supervision of the tiny cavity is maintained subsequently till healing is complete. This after-treatment is of supreme importance. The operation merely gives the surgeon access to the delicate mucoperiosteal lining of the attic, ulcerated by years of chronic inflammation. The recuperative power of this lining is trivial compared to, say, skin or mucous membrane. To leave this work to the unskilled hands of nurse, house-surgeon, or even clinical assistant is to invite failure. Unless a surgeon intends to supervise these cases personally, he had better not undertake transmeatal atticotomy.

Now, I am not going to maintain that this operation will always result in a dry ear. I could point out that a depressing proportion of classical mastoidectomies are failures from that point of view also. It is not a question of contrasting the merits of two alternative operations, but rather of deciding on the indication and function of two entirely different procedures. I submit that for "chronic perforating epitympanitis" the transmastoid operation is wrong, and the transmeatal is right. For chronic pan otitis the transmastoid is probably inevitable, but if conservation of function is desperately important, the surgeon may begin with a meatal operation provided he is prepared to do a subsequent mastoid exploration if otorrhœa persists. Between the two extremes there are many intermediate cases in which opinion might vary. My own preference will always be for the meatal operation. It only remains to give clinical details of illustrative cases.

RESULTS

First, let us show that transmeatal atticotomy can cure chronic otorrhœa which has defied intensive conservative treatment. It should be emphasised that in no case was the operation performed until it was obvious that a prolonged and intensive conservative treatment had failed. A minimum of two months was imposed, several cases were treated for six months, one for over a year, and one actually for nearly four years. Patients were seen weekly and even oftener if necessary. Ionisation, iodised boric powder, bipolar electrolysis, attic lavages with carbon tetrachloride, short wave diathermy, and other non-surgical methods were used, and it can be rightly claimed that these cases—apart from operation—were incurable and so doomed to progressive deafness. In several cases the hearing was at a very low level, the otorrhœa having been present for as long as twenty years.

Out of 17 such operations which I have performed during the last year, 13 are quite dry and 2 more recent cases are almost dry, 1 case had a further transmastoid exploration and is now dry, 1 case has continued to suppurate and must therefore be considered a candidate for a transmastoid operation. It is manifest that in properly chosen cases of chronic otorrhœa, a high percentage of cures is obtainable by this operation.

What of the effect on the hearing? This, after all, is the point which concerns us most. In only one case was the hearing impaired as a result of the operation. This is due to the fact that I unfortunately dislocated the incus and had to remove it. One patient complained of some loss of hearing after preliminary amputation of a polyp, but even in this case, the subsequent atticotomy restored his auditory acuity to its previous level. Three patients said that their hearing was not improved, but that it had certainly not deteriorated. We must remember that a dry ear is less liable to progressive deterioration than a suppurating ear. It is for that reason that I have spoken of the surgical "conservation" of hearing.

Surely it is not unreasonable to claim that these patients have been preserved from deafness. In the remaining 13 cases it is justifiable to claim much more than that. Everyone of this group achieved a

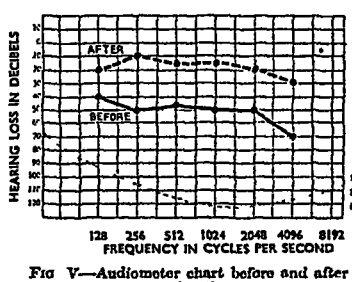

FIG V.—Audiometer chart before and after transmeatal atticotomy.

definite improvement in auditory acuity, and indeed in some of them the change was most dramatic. The audiogram shown in fig. V is typical, but for less technically minded readers it may be more satisfactory to read what the patients themselves have to say. For this purpose I sent out a questionary simply asking patients to describe the conditions of their hearing compared to what it was previously, and to state how they arrived at their conclusions. The following remarks are extracted from some of their replies:

(1) "There is a vast improvement in the ear. Many people who have known me for a number of years do not have to shout now. I can hear perfectly over the telephone." (This man's other ear was profoundly deaf.)

(2) "I am pleased to say the hearing in that ear (the right) was almost normal by April, 1939, and has

remained so to date." (This man had regarded his right ear as useless and merely attended because the otorrhœa of about twenty years' standing was becoming too troublesome.)

(3) " . . . for instance, I received a message by the telephone early this morning. A year ago this was a dead instrument to me. I now hear the sound of boiling water, and of our dog sleeping, &c., &c., in fact, my hearing is almost 100 per cent. perfect."

(4) " Willie was deaf for a few years before you took him for treatment. His hearing is now so much better that he can hear me when I am speaking quite low. He can also hear the least sound."

(5) " Before treatment I was quite deaf in that ear. Now I can hear a small watch ticking at 12 in., and a clock at 5 or 6 ft. away."

(6) " My ear is alright and I can hear quite well now. The only test I can tell you is that I have no pain now, and I can hear when anyone speaks. I do not have to ask them to repeat themselves."

(7) " Before you healed my ears, if I lay down for any length of time I went quite deaf. . . I nearly had to give it (my work) up as I could not hear the orders I myself know I am 100 per cent. better now, also I have been told so by others."

It would perhaps be even more convincing to see the changed facies, mentality, and even physique of some of these patients who have so dramatically recovered their hearing. I am quite certain that no surgeon who has once seen his work rewarded by such results would dream of doing a radical mastoid in chronic perforating epitympanitis. McKenzie was quite right when he said years ago that the correct operation was " to remove the thin plate of bone via the meatus—the mastoid route was quite unnecessary." I believe the present series of cases gives ample proof that he was not a false prophet

SUMMARY

Chronic perforating epitympanitis produces a type of otorrhœa which is frequently benign in that it may persist for many years without serious involvement of drum ossicles or mastoid bone

Because of its chronicity, and the definite (although infrequent) occurrence of intracranial complications, this condition has been regarded as an indication for a radical mastoid operation. This attitude has undoubtedly resulted in much unnecessary suffering and deafness

The alternative operation of transmeatal atticotomy has apparently never been performed in England This operation, though requiring considerable " skill," is a minor procedure from the patient's point of view. It takes about half an hour under local anæsthesia and the patient can leave hospital on the second or third day There is no external incision, no sutures or ligatures are required, and after-treatment, although technical, is reduced to a minimum.

In the presence of gross disease of ossicles and drum there is little to gain from this operation, and in chronic suppurative mastoiditis it is definitely contra-indicated.

Most cases of chronic otorrhœa in adult life, and many in childhood, are due to chronic epitympanitis. Generalised tympano-mastoid disease—i e , pan-otitis —may have been common years ago, but is comparatively rare now.

Cases are quoted to show that not only can the operation cure suppuration and thereby conserve hearing, but in favourable cases it may actually restore hearing which had been lost since childhood.

Surgeons in the past may have avoided this operation because of its technical difficulties, real and imaginary, but more important is the failure to distinguish between chronic epitympanitis and chronic pan-otitis.

In experienced hands complications should be much rarer than in the radical mastoid operation. There have been no complications in the present series

A dry ear can be obtained in a high proportion of cases and hearing is improved to a surprising extent.

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ANGINA IN PERNICIOUS ANÆMIA

WITH ELECTROCARDIOGRAPHIC CHANGES AND ABDOMINAL ANEURYSM

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(With Illustrations on Plate)

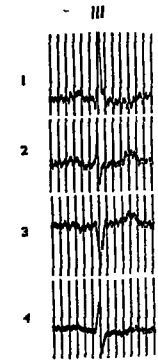
THE case here described showed two interesting features First, symptoms of angina pectoris were associated with pernicious anæmia and with electrocardiographic changes which disappeared after liver therapy Secondly, this was a good example of an abdominal aneurysm, a rare condition, confirmed by radiography, the outline of the aneurysm being extremely well shown owing to the presence of calcification.

CASE-RECORD

A nurse, aged 63, who had served in the late war, had complained of indefinite abdominal symptoms, chiefly constipation and abdominal pains, since 1918. In August, 1937, she had tachycardia on slight exertion, and was kept in bed for the next three months; on getting up she began to have precordial pains on exertion radiating down the left arm into the fingers. At the same time her abdominal pains became worse and vomiting set in She also complained of sore tongue.

On examination in April, 1938, she was thin and pale. Clinically the heart and lungs were normal and the tongue appeared normal. A pulsating mass was felt in the region of the lower abdominal aorta. A radiogram of the abdomen showed a calcified aneurysm of the abdominal aorta about 2 in. by 2¼ in., extending to the left of the spine at the level of the 4th and 5th lumbar vertebræ (figs I and II on plate) The aorta above and below the aneurysm showed calcification. The vertebræ were not eroded. An electrocardiogram on May 6 showed left ventricular preponderance and a negative T wave in lead I (fig III) Radiography of the chest showed slight cardiac enlargement and some calcification in the arch of the aorta. Blood-count showed a moderate anæmia: red cells, 3,900,000; hæmoglobin, 84 per cent., colour-index, 1 08; white cells, 7200 (polymorphs 62 per cent, eosinophils 1 per cent., large mononuclears 9 per cent); no abnormal cells seen, size of red cells 7 81 μ Wassermann reaction negative. Fractional test-meal showed complete achlorhydria.

In July, 1938, the abdominal pain and vomiting and anginal pain became worse, the latter now coming on even while at rest in bed Blood-count: red cells, 2,600,000; white cells, 1800; Hb., 54 per cent; C.I , 1 05; size of red cells 7 64 μ; anisocytosis, poikilo-



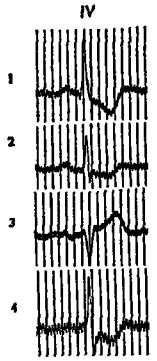
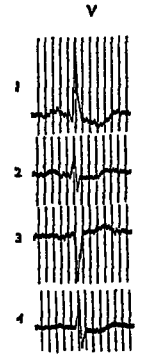


FIG III—Electrocardiogram, June 5, 1938 Left ventricular preponderance and negative T wave in lead 1

FIG IV—Electrocardiogram, July 26, 1938, during anginal attack Negative T waves in leads 1, 2 and 4, with depression of R–T interval and climbing T wave in lead 3



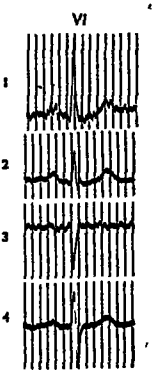


FIG V—Electrocardiogram, July 20, 1938 Negative T wave in leads 1 and 2 Left ventricular preponderance

FIG VI—Electrocardiogram, March 28, 1939 Normal. T waves in leads 1, 2 and 4 have become positive

cytosis, polychromasia and punctate basophilia, also a few normoblasts The soreness of the tongue was very severe The electrocardiogram taken on July 26, during an attack of anginal pain, showed negative T waves in leads 1, 2 and 4, with depression of the R–T interval and a "climbing" T wave in lead 3, the whole appearance being suggestive of a recent coronary occlusion (fig IV) Intensive liver therapy was then started, the administration of hydrochloric acid, which had been given previously, being continued After a few days of this treatment there was striking improvement in the patient's general condition and the anginal attacks ceased On the 29th the electrocardiogram showed a negative T wave in leads 1 and 2 and *left* ventricular preponderance (fig V) and resembled closely the electrocardiogram taken in *May*, 1938

Progress was rapid and continuous, and the patient was able to return home with a relatively *normal* blood-count, complaining of scarcely any abdominal symptoms beyond some abdominal discomfort and constipation All traces of anginal pain had gone On Jan 13, 1939, her blood count showed red cells, 4,400,000, Hb, 82 per cent; size of red cells 7 64 μ, some anisocytosis and poikilocytosis present The soreness in the tongue had entirely disappeared *On March 28* she felt quite well and her blood-count was red cells 4,600,000, Hb, 88 per cent, C I, 0 96 white cells 4600, size of red cells 7 3 μ, some anisocytosis and poikilocytosis The aneurysm was still felt pulsating in the abdomen The electrocardiogram on March 28 *showed no* abnormalities whatever, the negative T waves in leads 1, 2 and 4 having become positive (fig VI)

DISCUSSION

It has long been recognised that anginal pain is a common symptom in pernicious anæmia yet it is generally supposed that electrocardiographic changes are not found in cases of this type Thus Shirley Smith (1933), in a series of 15 patients *suffering* from severe anæmia of various types, took serial electrocardiograms without finding any electrocardiographic abnormalities or changes after specific anti-anæmic treatment He points out that in this respect pernicious anæmia and other severe anæmias differ from diabetes and other nutritional diseases in that he did find electrocardiographic changes in cases both of diabetic coma and hypoglycæmic coma Pickering and Wayne (1934) found no electrocardiographic changes even in those cases of pernicious anæmia in which angina was a well marked symptom It is true that Coombs (1926) suggests that certain electrocardiographic changes may be peculiar to severe anæmia, but he gives no particulars

There can be little doubt that, in the case described here, in addition to pernicious anæmia there were arteriosclerotic changes, this is shown by the presence of the aneurysm and the calcification in its walls When the patient was first seen, and when a relatively slight degree of anæmia was present, the electrocardiogram showed certain definite abnormalities such as left ventricular preponderance and a negative T wave in lead 1 Three months later, when an obvious and severe pernicious anæmia was present, symptoms of angina at rest had developed, and the electrocardiogram taken during an anginal attack was suggestive of a coronary occlusion Three days after the exhibition of liver therapy the angina had disappeared and the electrocardiogram, though still abnormal, was nearly the same as the first of the series After six months' liver therapy the electrocardiogram had become normal It is suggested that some arteriosclerotic coronary stenosis was present in this case, but that when the oxygen carrying power of the blood was normal this was not sufficient to cause ischæmia of the heart muscle When the oxygen carrying power was reduced by the pernicious anæmia beyond a certain point, however, myocardial anoxæmia developed, giving rise to the symptoms and electrocardiographic changes

I wish to thank the Director General of Medical Services Ministry of Pensions, for permission to publish this case, and Dr Arnold Stott for his kind help in preparing this report

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HISTIOCYTIC MEDULLARY RETICULOSIS

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(*With Illustrations on Plate*)

In the century following Thomas Hodgkin's (1832) paper his syndrome resolved itself into a multiplicity of pathological entities. The leucoses, syphilitic and tuberculous lymphadenitis and lymphosarcoma (Kundrat 1893) were isolated; Sternberg (1898) and others established the histological features of lymphadenoma verum but there remained a number of cases which defied classification. These pathologists and clinicians alike have been accustomed to dismiss as "atypical Hodgkin's disease" It is of one group of these atypical cases that this paper treats.

Where the cause of a morbid process is unknown its diagnosis commonly rests on the changes in the patient's tissues, the ultimate analysis of which must be microscopical; thus in the group of diseases under consideration diagnosis can only be made with certainty by the microscope The histological criteria must be rigid, for if the cause be unknown it is irrational to assume that disease processes in two cases are identical unless the tissue changes are identical. The histological criteria for the diagnosis of Hodgkin's disease (lymphadenoma verum) have long been established (Sternberg 1898, Andrewes 1902, Reed 1902, Longcope 1903, Ziegler 1911) and there can be no justification for including under that head—even with the qualification "atypical"—cases which do not show the characteristic histological picture however close their clinical and anatomical resemblance to lymphadenoma verum. Progress will only be made when sufficient "atypical" cases have been collected to be submitted to histological analysis and classification

In an earlier paper (Scott and Robb-Smith 1936) we published three such cases and reviewed previous reports We concluded that a group of diseases exists which are characterised by a progressive cellular hyperplasia throughout the hæmopoietic and lymphatic tissues; these conditions differ from one another by virtue of the histological type or types of proliferated cells but owe their interrelation to the common mesenchymal origin of these cells. In some instances the proliferation has the characteristics of neoplasia, in others it does not transcend hyperplasia; but in all the change occurs in a systematised manner throughout the lymphoreticular tissue This group includes such apparently diverse diseases as Gaucher's syndrome, the leucoses and "atypical Hodgkin's disease" To these conditions have been applied the general descriptive title reticulosis (Letterer 1924, Pullinger 1932), or, if neoplasia be present, reticulosarcoma. Common examples of reticulosis are lymphoid leucosis (lymphatic leukæmia), where a systematised lymphocytic proliferation exists, and lymphadenoma verum in which there is a hyperplasia of reticulum cells (primitive undifferentiated mesenchymal cells) with differentiation to myeloid and fibril-forming elements. A suggested classification of the reticuloses and reticulosarcomata on a histological basis has recently been published by one of us (Robb-Smith 1938).

In this paper we are recording four examples of histiocytic medullary reticulosis and surveying the published reports of cases which appear to us similar. These cases will be seen to present a clear-cut clinical and pathological picture and give force to our contention that detailed analysis of the reticuloses will show the existence of unsuspected clinico-pathological entities. These cases illustrate what we have come to regard as the typical clinical course of the disease: fever, wasting and generalised lymphadenopathy are associated with splenic and hepatic enlargement and in the final stages jaundice, purpura and anæmia with profound leukopenia may occur. Post mortem examination shows a systematised hyperplasia of histiocytes actively engaged in phagocytosis of erythrocytes

First Case *

A married woman, aged 48, was admitted to St. Bartholomew's Hospital on July 19, 1929, complaining of weakness, cough and swellings in the neck and axillæ.

History.—Apart from "consumptive bowels" in infancy and appendicectomy for dyspepsia at the age of 36 she had had good health until four weeks previously when a swelling in the right occipital region had appeared; within the next few days this had been followed by swellings on both sides of the face and neck. She had felt ill and weak and had lost her appetite. Two weeks before admission similar swellings had appeared in both axillæ and groins and an unproductive cough had started. Exhibition of arsenic had been followed by diarrhœa. Her weakness and cough had grown worse and to them had been added shortness of breath.

Physical examination.—Temperature 104° F.; pulse frequency 110 per minute. She was dyspnœic and sweating; sordes were present and the tongue was furred. The fauces were dry and hyperæmic. *Small lymph-nodes were palpable in the occipital*, pre- and post-auricular groups and in all cervical triangles, both axillæ and groins. The epitrochlear nodes were not enlarged. In the chest there was increase in parasternal dullness with impaired percussion note and crepitation at the right base. The heart was normal. The liver was enlarged to 2 cm. below the costal margin and the spleen could not be felt.

Investigations.—Urine: a trace of protein, otherwise normal. Blood-count: erythrocytes, 4,580,000 per c.mm.; hæmoglobin, 86 per cent.; colour index, 0 93; leucocytes, 2200 per c.mm.—neutrophil 59 per cent. (1296), eosinophil 2 per cent. (44), basophil 0 5 per cent. (11), lymphocyte 35 per cent. (770), monocyte 3 5 per cent. (77).† Blood-culture: sterile. Wassermann reaction: negative. Skiagram of chest: enlargement of lymph-nodes in mediastinum and both hila; interlobar pleural thickening, right.

Progress.—Pyrexia continued with an evening temperature of 102°–104° F., her general condition deteriorated, a diffuse purpuric eruption appeared and the spleen became palpable. She died on Aug. 14 after an illness of eight weeks.

POST-MORTEM EXAMINATION AND HISTOLOGY

The body of a wasted woman with petechiæ on the face and trunk. Discrete enlargement of lymph-nodes in neck, axillæ and groins. Brain: natural. Heart: numerous petechiæ on pericardial surface and in muscle; no valvular defect. Upper air-passages: natural. Pleuræ: old adhesions at bases. Lungs: early basal bronchopneumonia; mediastinal

* This case was briefly described by Pullinger (1932)

† The figures in parentheses represent absolute numbers per c.mm.

and bronchial lymph-nodes enlarged, fleshy and hæmorrhagic Peritoneum and alimentary tract natural Mesenteric and retroperitoneal lymph-nodes enlarged Liver enlarged, pale and fatty Spleen 450 g soft, small white nodules scattered throughout its substance Kidneys subcapsular petechiæ Ureters and bladder natural Genitalia natural Thyroid, suprarenals and thymus natural

Lymph-node —The normal architecture is distorted by a proliferation in the medulla and lymph sinuses The lymph follicles can be distinguished but are compressed and consist entirely of small lymphocytes The cellular proliferation replacing the medulla consists of reticulum cells and large lymphocytes, but outnumbering these are cells of similar size to the large lymphocyte with irregular outline and almost filled by a round or oval nucleus rich in basichromatin, nucleoli are not present, the cytoplasm is eosinophilic and mitotic figures are plentiful These cells are regarded as "prohistiocytes" Numerous histiocytes with small dark nuclei and ingested particles are present Multinucleate cells are scanty and fall into two types the typical "mirror-image" giant-cell of Sternberg and Reed and a cell with an eosinophilic cytoplasm and a contorted nucleus rich in chromatin resembling the prohistiocyte The sinus lining cells show proliferation with prohistiocytes and mature histiocytes lying free in the lumina, phagocytosis of erythrocytes and debris is in process The whole node is congested and there are occasional areas of focal necrosis The reticulin framework although stretched is normal and there is no increase in collagen

Spleen —The organ is congested and shows many areas of focal necrosis Throughout the medulla these is a cellular proliferation similar to that described in the lymph-node Some malpighian bodies, consisting of small lymphocytes, can be seen but others appear to have been replaced by reticulum cells and prohistiocytes Active erythrophagocytosis is in progress and the sinuses are filled with proliferated littoral cells and prohistiocytes A few nodules consisting of reticulum cells and prohistiocytes are present in which mitoses are common The reticulin framework has not been altered but in the cellular nodules there are few fibrils Much iron-pigment is present

Liver —There is proliferation of reticulum cells and prohistiocytes in the periportal tissues The sinusoids are filled with prohistiocytes and proliferated Kupffer cells, many of the latter containing erythrocytes The parenchyma shows fatty infiltration and much iron-pigment is present in the hepatic and Kupffer cells

Bone-marrow —Erythropoiesis and granulopoiesis are accompanied by a proliferation of reticulum cells and prohistiocytes, but neither this change nor erythrophagocytosis are as prominent as in the other organs No adipose marrow was preserved for examination

Areas of similar cellular proliferation are present in the interstitial tissues of the kidney and myocardium and around the vessels and sweat-glands in the dermis

Second Case

Male, aged 31, meat porter Admitted to St Bartholomew's Hospital on Jan 5, 1932, complaining of weakness

History —He had always been healthy until seven months before admission when he had started to feel tired and short of breath on exertion With difficulty he had continued at work for another month when weakness had forced him to seek advice A month later he had been admitted to the Archway Hospital with relapsing pyrexia, splenomegaly and hepatic enlargement After a few weeks lymph-nodes had become palpable in the posterior cervical triangles Blood counts had shown a hypochromic anæmia with 65 per cent hæmoglobin and 3000 leucocytes per c mm without specific changes in the differential count but with polychromasia and basophilic stippling of the erythrocytes After three months in hospital a zoster of the eighth right thoracic segment had appeared, accompanied by severe pain Two months later he had returned home, but after three weeks he had attended St Bartholomew's Hospital on account of a swelling in his neck and had been admitted on the same day

Physical examination —Temperature 102° F, pulse frequency 120 per minute He was pale and emaciated There were patches of alopecia at the nape of the neck and shotty lymph-nodes could be felt in all cervical, axillary and inguinal groups, the epitrochlear nodes were not palpable At the angle of the jaw on the right side was a soft swelling, unattached to the skin, measuring 4 by 2 cm The lungs were normal and a systolic murmur was audible at the cardiac apex A healing zoster was present over the right 6th, 7th and 8th thoracic segments where the skin was glossy, red and indurated The spleen was enlarged to 22 cm below the costal margin and the liver to 13 cm, both were firm and insensitive Signs of a small ascites were present

Investigations —Urine normal Blood-count: erythrocytes, 2,850,000, hæmoglobin, 53 per cent; colour-index, 0·9, leucocytes, 844—neutrophil young form 1 per cent (8), segmented 62 per cent (523), lymphocytes 27 per cent (227), monocytes 9 per cent (70), unclassified 1 per cent (8) Van den Bergh's reaction direct, negative, indirect, 0·25 mg bilirubin per 100 ml serum Wassermann reaction negative Skiagram of chest normal

Progress —Pyrexia, with an evening temperature reaching 103° F, continued and on Jan 22 he complained of sore-throat, his leucocyte count at this time was 968 per c mm He became progressively worse with cough, stridor and dysphagia, finally developing jaundice and dying on Jan 31, after an illness lasting nearly eight months

POST-MORTEM EXAMINATION AND HISTOLOGY

The body of a wasted jaundiced man with a diffuse petechial rash Discrete enlargement of lymph-nodes in neck, axillæ and groins Brain natural Heart subpericardial hæmorrhages Larynx: recent perichondritis with gangrene of overlying mucosa, sinus below and behind left vocal cord Pleura natural Lungs congestion and basal bronchopneumonia, mediastinal lymph-nodes enlarged, fleshy and hæmorrhagic Peritoneum and alimentary tract natural, mesenteric and retro-peritoneal nodes enlarged Liver 2000 g, surface pale with petechial hæmorrhages, on section uniformly pale and friable Spleen 950 g, adherent to surrounding viscera, two old and two recent infarcts, on section, dark red with scattered white nodules Kidneys, ureters and bladder natural Genitalia, thyroid and suprarenals natural Femoral bone marrow dark red throughout length of shaft with scattered small white firm areas

Lymph-node —A cellular proliferation is present in the medulla which has the same characteristics as in case 1 but lymph follicles can no longer be recognised and there is compression of the sinuses Reticulin fibrils are increased but there is no excess of collagen, erythrophagocytosis is prominent

Spleen —Apart from the infarcts the changes are similar to those in the lymph-node It is still possible to distinguish occasional malpighian bodies and these are often surrounded by an increase of reticulin fibrils The littoral cells show some hyperplasia but the chief change is in the medulla Erythrophagocytosis is pronounced but iron pigment scanty

Liver —The hepatic parenchyma shows extreme fatty infiltration Cellular proliferation with an increase in reticulin fibrils is found in the periportal tissues The Kupffer cells are hyperplastic and engaged in erythrophagocytosis

Bone-marrow —Cellular proliferation with ingestion of erythrocytes is occurring side by side with a patchy hæmoblastic reaction

Third Case

Male, aged 41, caretaker. Admitted to St Bartholomew's Hospital on Oct. 23, 1936, complaining of weakness

History.—He had had a mastoid operation at the age of 18 and a shrapnel wound in the left ankle during the war; otherwise his health had been good until four weeks before admission when after a day of heavy mowing he had suddenly felt weak and short of breath. He had remained at work for a further week with a sense of increasing exhaustion. At that time he had taken to his bed because of sudden swelling of his legs; this had lasted only three days but had been followed by persistent fever with sweating at night

Physical examination.—Temperature 101·2° F.; pulse frequency 90 per minute. He was thin, pale and sweating Dental infection was present with gums which bled when touched Small mobile discrete lymph-nodes were palpable in both posterior cervical triangles, both axillæ and groins, the epitrochlear nodes were not enlarged Scattered bronchitic sounds could be heard throughout both lungs. The heart was normal. The spleen was enlarged to 8 cm. below the costal margin and the liver to 3 cm.

Investigations.—Urine: normal Blood-count: erythrocytes, 2,780,000; hæmoglobin, 50 per cent; colour-index, 0·89, polychromasia and anisopoikilocytosis present; leucocytes, 1000—neutrophil young forms 1 per cent (10), band forms 7 per cent. (70), segmented 48 per cent. (480), lymphocytes 31 per cent. (310), monocytes 13 per cent. (130), platelets 70,000 per c.mm Sternal puncture: moderately cellular films; a promyelocytic type of granulopoiesis and active orthoplastic erythropoiesis. Adrenaline response: no primitive cells in blood. Van den Bergh's reaction: direct, negative; indirect, 0·2 mg. bilirubin per 100 ml. serum. Wassermann reaction: negative Skiagram of chest: normal.

Progress.—His condition gradually deteriorated; pyrexia continued reaching 105° F. on some evenings. On Nov 18 jaundice appeared which was followed by a generalised purpuric eruption, his leucocytes sank to 750 per c.mm with 56 per cent. neutrophils and his platelets to 8200 per c.mm. He complained of pain in the throat and examination showed a necrotic angina. On Nov. 26 he died after an illness of eleven weeks.

POST-MORTEM EXAMINATION AND HISTOLOGY

The body of a wasted jaundiced man with petechiæ on the trunk and abdomen. Discrete enlargement of lymph-nodes in neck, axillæ and groins. Brain: natural. Heart: natural. Pharynx: necrotic ulceration with sloughing of epiglottis Pleuræ: natural. Lungs: œdematous and congested; confluent bronchopneumonia right lower lobe; mediastinal and bronchial nodes enlarged, fleshy and hæmorrhagic. Peritoneum and alimentary tract: natural; mesenteric and retroperitoneal nodes enlarged. Liver: 2200 g.; cut surface green-yellow. Spleen: 1720 g.; several infarcts; cut surface soft and dark red. Kidneys, ureters and bladder: natural. Genitalia, thyroid and suprarenals: natural. Femoral bone-marrow: red throughout shaft.

HISTOLOGY

Lymph-node.—The histology is similar to that seen in cases 1 and 2 but in many of the nodes the medullary cellular pattern is loosened by a fibrinous exudate and it is in these zones that hæmorrhage has occurred Phagocytosis is active but there is little free iron The sinuses are compressed but littoral-cell activity can be seen. There is no increase in reticulin or collagen. In the periadenoid connective tissue of some of the nodes there is a proliferation of cells similar to those in the medulla

Spleen.—The degree of medullary hæmorrhage and necrosis is more marked than in any of the other cases but the histology is similar; medullary phagocytosis is active and the sinusoids are compressed. There is a moderate amount of free iron.

Liver.—The hepatic parenchyma is well-preserved though there is biliary retention in the central zones. In the periportal areas the cellular proliferation is considerable, consisting chiefly of reticulum cells, prohistiocytes and cells of the lymphoid series with few active phagocytes The Kupffer cells are proliferated and actively phagocytic. There is a moderate amount of free iron in the Kupffer cells and in the hepatic cells at the periphery of the lobules.

The *bone-marrow* is extremely congested and hæmorrhagic but it is not highly cellular; foci of cells of the histiocytic series are present.

Lung.—A subpleural nodule 0·5×0·6×0·8 cm. consists of a localised area of reticular cellular proliferation. The alveolar walls are thickened by collections of reticulum cells and lymphocytes; the alveoli are filled with alveolar phagocytes. There is no fibrosis nor bronchiolar obstruction to suggest that this is a secondary change.

Fourth Case

Farm-labourer, aged 52 Admitted to the Radcliffe Infirmary, Oxford, on Jan 3, 1939, complaining of weakness and abdominal pain

History.—For many years he had been deaf and this affliction coupled with a sluggish intellect made it impossible to obtain an adequate history For some years past he had suffered from abdominal pain but during the past three months this had become worse and he had begun to feel weak. These symptoms had increased until he had been forced to consult his doctor four days before his admission.

Physical examination.—Temperature 101° F.; pulse frequency 120 per minute. He was wasted and pale with a malar flush. The mouth and pharynx were normal. Firm discrete mobile lymph-nodes were palpable in the right axilla and both supraclavicular groups. The heart and lungs were normal. The liver was enlarged but the spleen could not be felt.

Investigations.—Urine: normal. Blood-count: erythrocytes, 1,490,000; hæmoglobin, 29 per cent.; colour-index, 1·0; considerable anisopoikilocytosis; leucocytes, 1900—neutrophil band form 6 per cent. (114), segmented 48 per cent. (912), eosinophil 1 per cent (19), lymphocyte 37 per cent (703), monocyte 8 per cent. (152). Wassermann and Meinicke reactions negative.

Progress.—His condition deteriorated with a regular intermittent pyrexia reaching 100°–102° F. in the evening and a tachycardia of 120–140 per minute His spleen became palpable and on Jan 13 an extensive purpuric rash appeared with œdema of the feet He died on the 18th after an illness which had probably lasted about three months.

POST-MORTEM EXAMINATION AND HISTOLOGY

The body of a wasted man with a purpuric eruption on the back; there was no jaundice. Moderate enlargement of lymph-nodes in neck, axillæ and groins Brain: natural. Heart: organising hæmorrhagic pericarditis; dilatation of all the cavities; fatty degeneration of the myocardium. Upper air-passages: natural; slight enlargement of the pharyngeal lymph-nodes which were dark red in colour Pleuræ: no effusion; old adhesions at the left apex and right base Lungs: pale and œdematous; old area of cavitation at the left apex. Mediastinal and tracheobronchial lymph-nodes: slightly enlarged. Peritoneum and alimentary tract: petechiæ on the œsophageal mucosa; the rest of the tract was natural and the lymphoid tissue was not increased in amount; the paraortic and mesenteric nodes were slightly enlarged, firm, discrete and hæmorrhagic Liver: 2130 g., pale with areas of periportal pallor suggestive of an infiltration Spleen: 954 g.; no perisplenitis; cut surface soft with an extremely congested pulp in which there were dark areas suggesting blood lakes; the trabeculæ and follicles could not be identified. Kidneys, ureters and

bladder natural Genitalia and endocrine glands natural Bone-marrow dark red marrow extending over three-quarters of the length of the femoral shaft The sternal and vertebral marrow was of a similar colour

Lymph-nodes.—These were examined from a number of areas and all show changes similar to those described in the other cases, though the hæmorrhagic character is not so marked and the essential medullary origin of the proliferation is obvious, the œdema and fibrinous exudate observed in case 3 are also present In places the follicles can still be recognised, the littoral cells in the sinuses are hyperplastic and contain some iron pigment There is no fibrosis nor periadenoid cellular proliferation

Spleen.—The medullary proliferation of prohistiocytes and actively phagocytic histiocytes is considerable as are the hæmorrhagic œdema and fibrinous exudate, necrosis is not marked The venous sinuses are compressed but the medullary blood lakes are liable to be mistaken for dilated venous sinuses unless reticulin impregnations are examined There is much free iron in the medullary histiocytes

Liver.—There is periportal and Kupffer-cell proliferation and much free iron-pigment in the liver cells and histiocytes

Bone marrow.—There is an active orthoplastic erythropoiesis with foci of the abnormal reticulum cells and at the periphery of these zones the histiocytes show ingestion of erythrocytes

There is also a proliferation of prohistiocytes in the interstitial tissues of the heart-muscle and kidney and in the alveolar walls of the lungs

Previously Reported Cases

We have found records of the following similar cases:—

TSCHISTOWITSCH AND BYKOWA (1928).—Male, aged 63, with two months' illness characterised by weakness, fever and cough Pyrexia, jaundice, left-sided pleural effusion, œdema of legs, generalised lymph-node enlargement Urine urobilin, no bile pigment Blood-count erythrocytes, 3,720,000, hæmoglobin, 69 per cent, leucocytes, 6600 (differential count normal)

Left-sided pleural effusion Spleen 500 g, dark red and firm Liver, 1650 g, pale with occasional nodules Generalised lymph-node enlargement Spleen and nodes occupied by diffuse proliferation of reticulum cells and histiocytes, many of the latter showing erythrophagocytosis, moderate phagocytic activity of littoral cells, some increase of reticulin in medulla Liver periportal proliferation of reticulum cells and actively phagocytic histiocytes Bone marrow foci of similar change

BYKOWA (1929).—Female, aged 69, died after an illness of six weeks with generalised lymphadenopathy, splenomegaly, jaundice and *consolidation* of upper lobe of right lung Blood count erythrocytes, 2,010,000, hæmoglobin, 49 per cent, leucocytes, 1800 (10·5 per cent neutrophils), platelets 27,170 Leucocytes later fell to 1000 per c.mm

Spleen 18 × 13 × 10 cm Normal architecture replaced by proliferated histiocytes and atypical phagocytic cells, no reticulin increase, some littoral phagocytosis Liver periportal cellular proliferation, phagocytic activity of Kupffer cells Bone marrow little hæmopoietic tissue but great increase of actively phagocytic reticulum cells Lungs increase of alveolar phagocytes

DERISCHANOFF (1931).—Female, aged 26, with an acute illness associated with weakness, pallor and splenomegaly Blood count erythrocytes, 650,000, hæmoglobin, 30 per cent, leucocytes, 7000 (differential count normal) Splenectomy followed by death

Spleen, 2100 g, great phagocytic activity in medulla and sinuses with a little reticulin increase Lymph-nodes similar Liver localised nodules of phagocytic cells and increased activity of Kupffer cells

DAMESHEK (1933).—Male, aged 39, with weakness and intermittent pyrexia for six months On examination three months before death generalised lymphadenopathy with splenic and hepatic enlargement Blood-count erythrocytes, 2,830,000, hæmoglobin, 55 per cent, leucocytes, 3500, later falling to 1100 with 69 per cent neutrophils

Spleen, 310 g, several infarcts and grey-yellow nodules, medulla replaced by proliferation of large polymorphic cells with dark nuclei, marked siderosis and erythrophagocytosis Lymph-nodes similar Liver brown red with grey nodules, periportal cellular proliferation, Kupffer cells active Bone-marrow similar changes

NORDENSON (1934).—Female, aged 65, with five months' illness attended by pain in sacrum, weakness and emaciation Blood-count erythrocytes, 1,800,000, hæmoglobin, 37 per cent, leucocytes, 4800

Spleen, 350 g, follicles small; pulp and sinuses replaced by large *cells containing much hæmosiderin* Lymph-nodes similar changes Liver enlarged, red-brown, sinusoids filled with atypical darkly staining cells containing hæmosiderin, no clear distinction between periportal cells and those in sinusoids. Bone marrow similar

BEAVER AND JOHNSON (1934).—Female, aged 26, with three months' lassitude, irregular fever, diarrhœa and abdominal distension Blood-count erythrocytes, 1,500,000, hæmoglobin, 68 per cent, leucocytes, 7100

Bilateral pleural effusions, inactive rheumatic valvulitis, *ascites* Spleen, 300 g, purple hæmorrhagic nodules on cut surface; follicles small, sinuses engorged, cellular proliferation throughout medulla with active phagocytosis and areas of necrosis Lymph nodes generalised enlargement with histological changes similar to those in spleen Liver, 2250 g; nodules on capsule and numerous hæmorrhagic *areas on section*, *necrosis of parenchyma* periportal proliferation of atypical histiocytes and giant cells, Kupffer cells inactive

Discussion

The clinical picture.—The uniformity of these ten cases justifies an attempt to describe a clinical picture All the patients were adults and the sexes were equally represented

The disease was ushered in by asthenia, emaciation and a profound general intoxication accompanied by high, and sometimes relapsing, pyrexia The lymph nodes were enlarged in nine of the ten cases and although this change was usually generalised and moderate in degree, in some instances enlargement of one group predominated Splenomegaly was present in all and in eight the liver was palpably enlarged Seven cases showed jaundice in the later stages and where details are available they suggest haemolysis as its basis In our four cases a terminal purpuric eruption was noted

The blood changes serve to distinguish the disease from acute leucosis although sternal puncture may be required to exclude the leucopenic variety Anæmia was constantly present but its severity was usually in direct ratio to the duration of the illness, it was commonly normocytic but in some macrocytosis was a feature Leucopenia was present in seven cases and in two of those reported here was profound enough to be associated with necrotic angina, the differential count however did not show agranulocytosis but a proportional reduction in all leucocytes with some "shift to the left" of the neutrophils There was thrombocytopenia in the two cases in which platelet counts were made

The course was rapid and all cases terminated fatally, the shortest after six and the longest after thirty two weeks, the mean duration was fifteen weeks.

Pathology.—At post mortem examination the general changes common to cases of profound anæmia

coexisted with wasting, jaundice and cutaneous and subserous petechiæ. The characteristic findings were confined to the lymphoreticular tissues There was generalised moderate enlargement of lymph-nodes which individually were discrete and soft, showing on section a pink surface with areas of hæmorrhage Splenic enlargement was of varying degree (310–2400 g, mean 880 g); infarction with overlying perisplenitis was common and the cut surface was maroon in colour with raised paler areas 0·5–2·0 cm in diameter: the malpighian bodies could not be seen and although the pulp was soft it was not diffluent. Enlargement of the liver was the rule; on section the organ was pale with areas of hæmorrhage, while lighter zones could be distinguished in the periportal tissues The marrow of the long bones was commonly red, hæmorrhagic and interspersed with firmer pale nodules In some cases the lymph follicles of the intestine were prominent and in others subcutaneous nodules were found.

The histological changes consist in a systematised cellular proliferation throughout the lymphoreticular tissues together with siderosis which is most intense in the hepatic parenchyma and the Kupffer cells. These changes occur in the lymph-nodes, the medulla of the spleen, the periportal tissues and focally in the bone-marrow and dermis. They are similar in all these situations and a detailed description will be limited to the lesion as seen in the lymph-node, for here all the characteristic appearances are gathered together in a small compass

The normal structure of the node is modified by a cellular proliferation in the medulla; in some cases the follicles, although compressed, can yet be distinguished, in others they are obliterated by a proliferation around their central arterioles The littoral cells of the lymph sinuses are often hyperplastic and actively engaged in erythrophagocytosis The proliferation in the medulla is composed of reticulum cells and large lymphocytes but overshadowing these are numbers of cells of the histiocytic series Some are typical histiocytes containing erythrocytes and nuclear debris; others, which we regard as their precursors, are non-phagocytic These prohistiocytes (Scott and Robb-Smith 1936) have a diameter of 12–14 μ with irregular contour and a pachychromatic nucleus averaging 9 μ in diameter which is set in an opaque eosinophilic cytoplasm. Mitotic figures are often found and giant prohistiocytes are not uncommon, their twisted nuclei, rich in basichromatin, contrasting sharply with the pale "mirror-image" nucleus of the Sternberg-Reed giant reticulum-cell of which examples are also frequently seen. Areas of hæmorrhage, fibrinous exudate and coagulative necrosis occur in the medulla, and although silver impregnation at times shows an increase in reticulin there is no excess of collagen and no fibrosis

It should also be emphasised that the cellular proliferation and active phagocytosis is predominantly in the medullary portion of the nodes In many bacterial infections—for example subacute bacterial endocarditis—there is often a considerable proliferation of the littoral cells in the liver, and elsewhere, with much phagocytosis; but in those conditions there is no proliferation in the medullary portion of the spleen or lymph-nodes nor in the periportal areas of the liver; further, the large number of the prohistiocytes and the hæmorrhagic areas secondary to the œdema and fibrinous exudate are characteristic changes in histiocytic medullary reticulosis.

It remains but to stress the differences between the histological appearances just described and those of lymphadenoma verum where the cellular proliferation in the medulla is pleomorphic with myeloid elements and fibrosis but without notable erythrophagocytosis.

The clinical and morbid histological picture exhibited by our four cases and by the other six recorded is sufficiently uniform to justify our contention that they are examples of a disease process sui generis. Neither the course of the disease nor the morbid histology of the lesions resemble those of Hodgkin's disease. These cases show a closer affinity with acute leucosis, but in them the systematised hyperplasia affects the histiocytes and their precursors and not the leucopoietic cells For this condition we have suggested the histologically descriptive name "histiocytic medullary reticulosis"

Conclusions

1 Four cases are recorded of a clinical and pathological entity for which the name "histiocytic medullary reticulosis" is suggested.

2 This condition has previously been accepted as a form of "atypical Hodgkin's disease," although the two disorders are in fact dissimilar and unrelated.

3 Previous reports of six similar cases have been found.

4 The clinical course is characterised by fever, wasting, generalised lymphadenopathy, splenomegaly and hepatic enlargement. In the terminal stages jaundice, purpura, anæmia and profound leucopenia are common. All cases ended fatally.

5 The pathological findings are a systematised proliferation of erythrophagocytic histiocytes and their precursors throughout the lymphoreticular tissue.

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". The highly educated minority seems to be close to the crossroads in the progress of higher learning Their leadership in thought and practice can continue only as they find effective ways to distribute useful knowledge and service and to lead the majority toward sympathetic participation in advancing knowledge The mass of knowledge-consumers and users, even though they are not primarily discoverers, now need, and sometimes expect or demand, enough insight into new knowledge that they may appreciate its significance"—Dr OTIS W. CALDWELL, general secretary of the American Association for the Advancement of Science, *Science*, June 30, 1939, p. 595

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF PSYCHIATRY

At a meeting of this section held on July 11, with Dr H. CRICHTON-MILLER, the president, in the chair, a discussion on

Euthanasia and the Psychoses

was opened by Mr H H GREENWOOD He outlined the history of the movement in favour of voluntary euthanasia, and the provisions of the bill to which the House of Lords refused a second reading in December, 1936, largely on the advice of Lord Dawson and Lord Horder The bill provided that a person suffering from an incurable and fatal illness which involves severe pain may apply to receive euthanasia He must be of sound mind and have attained majority The application must be accompanied by two medical certificates, one from the sufferer's own medical attendant and one from an independent practitioner these were to be sent to a referee, an official of the state, who if he saw fit could issue an official permit The person to administer the euthanasia would be a medical practitioner licensed for that office Mr Greenwood summarised the objection to the bill on the ground of the sanctity of human life It is admittedly difficult, he said, especially in psychiatry, to declare that a given condition is incurable before the introduction of malarial treatment and convulsion therapy general paralysis of the insane and schizophrenia were believed to be incurable Clearly the 'independent practitioner" must be an alienist, as he must assess the patient's soundness of mind The law, always suspicious of the integrity or the capacity of the alienist, is apt to make the facile generalisation that an act of self-destruction is of itself evidence of unsoundness of mind. Mr Greenwood suggested that if an applicant for euthanasia made a will, his application might raise doubt of his testamentary capacity No medical man would accept the office of administrator of euthanasia, but if the final administration is made by the patient it is an act of suicide, and the problem is removed to a different plane

The bill laid emphasis mainly on bodily illness and suffering Twenty per cent of suicides, however, occur in the insane Mental pain may be sufficiently dreadful as a concomitant of physical illness, but the mental pain of the psychopathic and the insane is a terra incognita explored only by the psychiatrist and probably outstrips in intensity any physical suffering No sane person can comprehend the suffering that impels the melancholic to suicide The sane sufferer begs for euthanasia, but the suicidal insane person demands death imperatively Driven by an inner compulsion, he will make the opportunity to achieve it Mr Greenwood asked whether the term "voluntary euthanasia" excludes those who are demonstrably insane and who not only seek death but demand it

Dr LETITIA FAIRFIELD said that at first sight the suggestion that euthanasia should be available to psychotics is singularly attractive No human misery is so excruciating to the sufferer and so painful to the onlooker, and in no state does the patient more frequently give the strongest demonstration that he wishes to be rid of his life Death as envisaged by the psychotic may be coloured by the nature of his illness, and probably also depends on the conception of death which is in the minds of most persons The large proportion of suicides are probably psychotic There is hardly any form of psychosis in which the desire to end life may not find expression at some time or another Some deaths may be interpreted as panic stricken pell mell flight from intolerable anguish, mental or physical, in others the motive is more subtle A belief in immortality is found among all races and religions The desire for death has been interpreted by psychologists as a longing to return to the mother's womb, and the beatific vision, or the Buddhist ideal of Nirvana, has been held not very different from the concept of the return to the prenatal existence This picture is, however, said Dr Fairfield, wholly incomplete unless its ambivalent character is recognised The dread of death is as profound as the longing for it The psychotic, like the sane person, has this instinctive dread of the unknown, of this second trauma which completes and cancels out the first trauma of birth His dread may be temporarily conquered by his disappointment or pain, but it remains an essential part of his mental equipment

The feeling of guilt and judgment is the very basis of some psychoses It has little or nothing to do with theories of the after life, religious belief or previous conduct To many persons, especially later in life, it makes death a very dreadful thing; this dread may even impel a patient to kill himself—to fling himself into the abyss into which he dreads to fall The teachings of the Christian religion are relevant to this inquiry because they form an important part of the training and the fundamental beliefs of most mental patients Just as a Christian may not flee from death at the cost of honour, so he may not seek it without the permission of the Creator. Would the psychotic, asked Dr Fairfield, be grateful for death if it were offered him? Would a death agreed to and inflicted by others meet his peculiar demand? The fear of death might rather add infinitely to the terror at present attached to mental disease in the mind of the public She asked whether the bill proposed that the psychotic is to be dealt with only on his demand Would the method of suicide be left to his choice? Is it proposed that mental hospitals should have licensed suicides whose point of view has been approved by some tribunal and who are at liberty to destroy themselves in any way they prefer, and a second class of patients whose application is before the Ministry of Health, and a third class whose application has been rejected and whose misery may thereby be increased?

When a reformer first begins to argue that these rights of life and death are in the hands of the individual to be exercised on hedonistic motives, recognising no higher rule, he finds himself in the same position as those who advocate that a woman should be allowed the right of abortion by her free individual choice, subject to the control of a tribunal The proposal to set up a tribunal and official machinery completely negatives the supposed right of the individual and the proposition is reduced to an absurdity, for the two halves of it are incompatible

The most acutely agonising mental conditions are curable disorders Are the authorities (asked Dr Fairfield) going to deny a patient's right to commit suicide because they hope his condition is curable, and if so, how long must he wait? Are they to consider the degree of the patient's agony, or the validity of their own prognosis? The manic-depressive

between his attacks thinks life worth living, and that interval, when he has a balanced judgment, is the time when he should make his decision It would be quite impossible to make the public understand the precise limit of the psychiatrist's power under any bill which proposed euthanasia for the insane Public opinion has passed with difficulty through an era of the most profound distrust of the mental hospital. One of the popular beliefs concerning mental hospitals and public institutions has been that "they do you in" Gradually that belief has been conquered —but the advocates of euthanasia apparently propose to make it true If they had their way, then a consequence of psychosis would be that, perhaps for the patient's own good, at any rate on someone else's opinion, the power over his life would pass into the hands of another. That is the fundamental proposition the limits of which cannot be exactly defined and the terror of which would cast an extra shadow over the gathering clouds which even now make an approaching psychosis terrible enough Psychiatrists would be better concerned in looking after the welfare of their patients in this world than in hurrying them into a world of the terms of entrance into which they know very little, except that gate-crashing is prohibited.

Dr IAN SKOTTOWE suggested that the possibility of euthanasia might lead to a diminution of effort in the attempt to find a cure In dealing with the psychotic the whole question turns on the word "suffering" Are psychiatrists, he asked, so sure that the melancholic is in fact suffering an agony comparable to that of the cancer patient? Work done at Cardiff on psychogalvanometric and blood-sugar responses indicates that the patients who harp most continuously on death and ask most vehemently to be allowed to die are those whose responses show the least real emotion and feeling He agreed that the patients who may be believed on objective grounds to experience true suffering are the ones who are likely to recover If the Freudian view of melancholia is correct—the inturning of the sadistic impulse and a regression to earlier levels—then the patient is enjoying his suffering and there is no argument for putting him out of it We have only to look round to see the position which we have reached through our appalling habit of solving every personal problem by making a rule about it Rules are generally made as a substitute for personal responsibility, and they will never be an effective one In the problem of euthanasia the personal responsibility is twofold: that of the patient and that of the doctor, of the two the doctor is probably the less well-adjusted and therefore the less well-fitted to decide on the patient's fate It is not credible that the Divine permission can be granted at the pearly gates of the Ministry of Health, or be personified by the Home Secretary This is not a problem for legislation If the psychiatrist can first clarify his personal problem and then by empathy feel himself into the patient's situation and ask himself whether he in that situation would hang on or give up as long as a spark remained, the answer would almost certainly be that he would hang on

Dr C O. HAWTHORNE criticised the bill for proposing to introduce a fresh cause of distress to friends and relatives It treated the patient as though he were completely isolated Every practitioner knows that such a proposal would if enacted lead to the most anxious discussion in family circles whether a father or mother should or should not be encouraged to an act of suicide After the death, relatives would always be found to say that it should not have been allowed and to quote similar cases in which the patient had recovered. He objected to the proposal to lay this duty on the doctor If euthanasia became the law of the land, the state must find an executive officer.

Dr MURDO MACKENZIE pointed out that extreme pain leads commonly to distortion of mental rhythm, which must invalidate the patient's soundness of mind.

The PRESIDENT emphasised the difference between the expiatory motive in suicide and the desire to die To be put to death by the act of another would not satisfy the unconscious motive of the expiatory suicide. his death has to be at his own hands The demand for death in a mentally disordered person is probably akin to the common demand of patients for change of environment, to be allowed to go away. The request is purely destructive and is a result of a projection of the mental state on to the environment. The act of putting a person to death is often disastrous to the mental integration of a judicial executioner, and in a case which the President quoted a man who had given his father, speechless with pain, an overdose of morphia in the conviction that he was acting rightly, had none the less suffered a severe neurosis It is not in human nature, he concluded, to be an executioner on a rational basis, and we ought perhaps to be thankful that it is not.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

THE annual meeting of this association was held in the Royal Pavilion, Brighton, on July 12

Presidential Address

Dr HELEN BOYLE, in her address "Watchman, what of the night?" said that she hoped to show that, in mental medicine, night was departing and day approaching. The first great step in this country was taken by the late Dr Rayner. He realised clearly that patients in a mental hospital had often suffered for a long time before being admitted, and that by early treatment they might have recovered before reaching the stage at which they could be certified He found that these patients presented themselves first at the general hospitals, sent often by their local doctors He therefore persuaded St Thomas's Hospital to establish an outpatient department for them in 1889, and worked in it himself till 1905 Dr Percy Smith had exceptional opportunities for observing the earliest certifiable patients at Bethlem and later he started the second outpatient clinic at Charing Cross Hospital Dr Goodall's clinic at the Cardiff Hospital took the movement to the provinces Many were the quips and jeers in those days, and yet the public on the whole has been more readily convinced of the value of early treatment in mental medicine than the medical profession itself. Now the idea is slowly seeping into the minds both of the profession and of the people at large that every general hospital is failing in its duty if it does not have at least an outpatient department for nervous patients Sir Maurice Craig was the pioneer of physical and mental rest (now sometimes expanded into prolonged narcosis) He put numbers of his patients to bed for rest-cures, with or without massage This in the early days caused laughter

I recall that one of the rare differences of opinion I had with my very good head attendant at Claybury was when I insisted on keeping some of my feebler patients in bed She warned me that if the commissioners came they would be much annoyed to see so many in bed Sir Maurice Craig also did more probably than anyone else in this country to help the rank and file of the profession to appreciate the physical side of mental and nervous breakdowns At this time there came a new trend of thought—the study of the emotions and their influence on character and conduct From the welter of differing psychotherapeutic theories which developed it is possible to distinguish the gradual emergence of a type which, being a compromise, is dear to British hearts This sound and sensible practice avoiding extremes may ultimately be called the British school

The next great practical step was taken by the late Dr Carswell of Glasgow, who started under the local authority in 1904 two wards separate from the infirmary, but close to it, into which he admitted those nervous and borderland patients whom he regarded as in need of treatment but who were not certifiable Then in 1905 the "Lady Chichester Hospital" was started We were convinced that its right place was in close association with a general hospital, and our little hospital was offered at the time of its birth to the Royal Sussex County Hospital The offer was refused, although I was willing to make myself responsible for the financial side for a number of years The start was therefore made independently by our clinic on £200 and a lot of faith By slow degrees the hospital grew and was found useful, particularly in the Great War when we took in patients with breakdowns from war service and air raids The Lady Chichester Hospital later found its present home in New Church Road, Hove, and in 1930 the Royal Sussex County Hospital, on the proposal of Dr Broadbent, itself suggested a liaison with us It started an outpatient clinic for early nervous cases and we gave six beds for men and six for women

What of the future? There are, and should be, in any living movement, differences of opinion as to methods, there should be none as to the aim For us the aim is to find for this nation, and, as far as in us lies, for all nations, the best means of prevention and the best treatment for nervous and mental instability, and thus to establish a wise and secure mental adjustment Numbers of us are already battling with the intricate obscurities of the psychological questions in unemployment and malnutrition and the origin of the psychoses and psychoneuroses, but consider the most urgent problem of all It is easy to say "No one in their senses would ever make another war, it would probably exterminate our civilisation" Everyone agrees But nothing except a universal mental readjustment can stop wars

A movement gaining momentum every year is the movement for a better training, both of the medical student and of the young postgraduate, in psychological medicine We must throw open the doors of our mental hospitals not only to the voluntary patients but to any medical men and women who wish to gain experience in this most difficult specialty Geographical difficulties are still considerable It is to be hoped that local authorities, in choosing sites in the future, will realise the value of close relations between hospitals of all kinds, the medical profession, the social services and the patients' friends

In conclusion, may we in this country never lose individual vision, freedom to realise it, and the generously given voluntary work which is almost a distinctive feature of Great Britain—being jeopardised at present but it is worth fighting for Once lost it will hardly be regained.

Securing Early Treatment

Dr W J T KIMBER (St Albans) said that for inquiring into the mental, bodily and environmental state of the patient a medical and psychiatric team of workers was required, and such teams were available only at the larger general hospitals Their cost must if necessary be met by the local authority The director should be a psychiatrist with broad general medical and surgical experience, the personnel should include a psychiatrist, part time paid psychotherapists, a social worker and (for child guidance clinics) a psychologist Psychotherapists should have had a personal training analysis The child guidance unit could be at a general hospital, or at the mental hospital, or elsewhere, but all the mental health services should be incorporated in a definite scheme Beds were a necessity for any clinic beds in a small clinic or a hospital ward were useful provided they were suitably staffed, beds in a mental hospital with a progressively educative and recreative regime were of greater value, but would not be acceptable to the public unless the amenities, and the classification of patients were considerably better than they were at present in most mental hospitals

Dr JAMES TILAD (London) said that "long" and "short" psychotherapy differed not merely as regards the number of interviews or the length of treatment, but also in the method of approach to the patient by the doctor, the social worker and others concerned in his treatment Only patients of high intelligence and sufficient education were suitable for prolonged and deep analytic treatment In 100 cases of psychoneurosis referred to the out patient department of the Lady Chichester Hospital only 4 were thus treated The incidence of physical illness in the series had been high, and the department gained greatly by having a hospital back ground He was satisfied that help could be given even to the chronic psychoneurotic, one must assess the patient's optimum and make this the objective Inpatient care was required (1) when treatment must be prolonged and intensive, (2) when physical conditions demanded complete rest, (3) when the patient must be removed from his environment, or (4) when the diagnosis between psychoneurosis and neurosis was in doubt Most of these cases refused point blank to go to a mental hospital on any terms and there was a great need for special hospitals, linked with both general hospitals and mental hospitals, and child guidance clinics, where some of the medical staff should be mental hospital doctors

Dr NOEL HARRIS (London) said that at present there were not enough trained doctors At Woodside Hospital for Functional Nervous Disorders there had recently been a greater demand for beds for the milder psychotics and mixed cases, than for pure psychoneurotics Nursing was of great importance as a bad nurse could do more harm than good The treatment of early cases as inpatients in mental hospitals still presented difficulties, for many years a stigma would remain in the minds of the public Moreover, so long as quiet patients were mixed with excited disturbed patients, it was hopeless to try to treat the early case This depended more on lack of vision than lack of possibility of modifying the situation Facilities for training psychotherapists

were still inadequate, although improving, and hostility between psychiatrists and psychotherapists often had damaging effects on the patient. The public should be educated to demand early treatment and to accept the mental hospital as their friend and helper, instead of fearing it.

Dr. DORIS ODLUM (London and Hove) said that to many people it seemed the psychoneuroses resembled the Loch Ness monster, which was visible only to those who went out to seek it with binoculars and a firm intention of finding something The new psychotherapeutic creed embodied, as articles of faith: "We believe in the psychoneuroses; we believe in the early and preventive treatment of the psychoneuroses and minor psychoses; we believe in the value of child guidance; we believe in outpatient treatment, carried out by an adequately trained staff in suitable surroundings; we believe in inpatient treatment; we believe in the psychosomatic approach and all that this implies" Beyond this point however, all was still in the realms of controversy.

There was no question that the mental hospital had in the past pursued a regrettable policy of isolation In some cases this had almost amounted to purdah, though it was doubtful whether the motive was modesty, self-sufficiency or fear. This attitude had done much to perpetuate the stigma, and contributed to the schism between the so-called psychiatrist and psychotherapist, which, if it persisted, would inevitably wreck the whole mental-hygiene movement The more the mental hospital came into the open, the more it was prepared to give itself to the community and to receive from the community, the greater service would it afford. In connexion with the social reorientation of the patient Dr. Odlum remarked on the important part that was played by Woolworth's stores in reawakening interest in mundane affairs. She agreed with Dr. Flind that very few patients would respond to the more profound types of mental analysis. About 8–10 per cent of her outpatients need a period of inpatient treatment, and would not recover without it In hospital treatment she assessed the importance of the nurse at about 75 per cent and that of the doctor at 25 per cent A stupid nurse could undo in a few hours the psychotherapeutic work of many weeks or even months.

Dr. W. MCCARTAN (Haywards Heath) said that it was difficult to give adequate psychotherapy in a mental hospital. There was a shortage of both trained medical and suitable nursing staff. Of the total admissions in the Brighton area last year sixty-two per cent. were voluntary patients, and for most of them psychotherapy would have been valuable The services of the local public-assistance department should, if sympathetic, be utilised, for social and economic problems played a large part in the causation of mental illness In Brighton the mental-hospital social worker had a desk in the local P.A.C. offices with access to their files and direct contact with the officers

Dr. R SESSIONS HODGE (Crewkerne, Somerset) said that if disease was "an ætiological constellation producing a certain engram" the family doctor was in a position to observe the formation of the constellation, and could act as a field-worker recording the natural history of disease. Outpatient treatment was eminently desirable, as the resocialisation of the patient was more easy if he was not removed from his environment. The stigma of the mental hospital was still very strong in the west of England.

Dr. ROBERT THOMPSON (Armagh, N. Ireland) thought that the wrong turning had been taken in transferring general-hospital methods to mental hospitals and in employing nurses with a general training who did not understand the mental case

Dr. E. F. SKINNER (Sheffield) said that he had treated a number of early and mild psychotics in his own general wards, and thought that they did better there than in a mental hospital. His clinic was known to the students as the Cuckoo Clinic, but they all came to it

Dr. GORDON MASEFIELD (Brentwood, Essex) believed that the mental hospital, properly run, was the ideal place for the early case, but he agreed that there must be proper classification and segregation of the noisy from the quiet, sensible cases. The special hospitals advocated would cut out the admission units in the mental hospitals. It was wrong to speak of the stigma, or to admit that any existed.

Dr. K. C BAILEY (Warlingham) said there were not enough assistant medical officers in mental hospitals to undertake psychotherapy. If the medical profession did not supply the need, non-medical people would take it on

Dr W. C. M. SCOTT (London) said there was as much difference between superficial and deep psychotherapy, or what he would call minor and major psychotherapy, as between opening a boil and brain surgery. The failures of analysis needed investigating, but the failures of the superficial type of psychotherapy needed investigating also.

Dr. HAROLD PALMER (London) said that in other countries—for example, at the Pennsylvania Institute, Philadelphia—patients could be admitted for about three weeks for investigation and treatment; this was valuable for the patient who could not afford to leave his work for a long period He strongly supported the proposal to develop special hospitals for early cases; he would be utterly opposed to any of his relatives going to a mental hospital.

The PRESIDENT did not agree with Dr Gordon Masefield that we ought not to admit the existence of the stigma It was only by facing the realities of the situation that we could hope to deal with it in a constructive manner.

Sir HUBERT BOND (London) concluded the discussion by saying that he thought it would prove to be the most far-reaching of any that had ever taken place at a meeting of the association.

Psychotherapy and the Skin

Dr. TWISTON DAVIES (Brighton) said that there were few cases of skin disease in which the psychological specialist could not help. Even such conditions as alopecia areata had a strong psychological factor Probably it was due to a specific microbic infection, but a state of psychological instability would produce a lowered resistance. He and Dr. Hingston had investigated several such cases together.

Dr. LAMORNA HINGSTON (Hove) said her investigations in the dermatological department had led her to believe that many dermatoses represented a psychosomatic reaction, indicating anxiety in certain personality types, mostly the cycloid type. They represented a substitute for repressions.

Sir LAURENCE BROCK (chairman of the Board of Control) said he had noticed that psoriasis was exacerbated by acute anxiety or overstrain He suggested that mental stress could upset metabolism

(To be continued)

REVIEWS AND NOTICES OF BOOKS

Silicosis and Asbestosis

By Various Authors Edited by A. J Lanza, M D , assistant medical director, Metropolitan Life Insurance Company, chairman of industrial hygiene committee of the New York Tuberculosis and Health Association London Humphrey Milford, Oxford University Press 1938 Pp 439 25s

In the last ten years much work has been done on silicosis and asbestosis but in spite of this it is still difficult to answer many apparently simple points about these two diseases Thus, it is still disputed whether free silica or siliciate causes silicosis, and again the mechanism by which active dust particles set up fibrotic changes in the lungs is not definitely known Indeed in some circles the entity of silicosis as a disease separate from tuberculosis is challenged We welcome therefore a book by acknowledged experts

A useful chapter on the history of silicosis and asbestosis is followed by one on their ætiology, symptoms and diagnosis Silicosis is defined as "a disease due to breathing air containing silica (SiO_2), characterized anatomically by generalized fibrotic changes and the development of miliary nodulation in both lungs, and clinically by shortness of breath, decreased chest expansion, lessened capacity for work, absence of fever, increased susceptibility to tuberculosis, and by characteristic X Ray findings" —a definition formulated by the committee on pneumoconiosis of the industrial hygiene section of the American Public Health Association It is accepted by the authors that the cause of silicosis is silica or quartz, although other dusts may produce definite pulmonary fibroses The findings of a number of committees of inquiry on the pneumoconioses are quoted at length, often without comment In regard to what are called safe concentrations of dust in various industries, it is said that atmospheric concentrations of silica or asbestos dust, which may have proved incapable of producing pneumoconiosis in one industry, may not necessarily be harmless in another Therefore no universal standard of permissible dust concentration can be set up at the present time This is a wise attitude to adopt, particularly when such standards as have been laid down disregard the important factor of individual susceptibility to silica or asbestos dust

The chapter on X ray diagnosis is the longest in the book and could with advantage have been made much shorter, in it E P Pendergrass has not limited himself to the X ray appearances, but deals with subjects which should have come under the survey of other contributors He does however include an excellent section on the X ray picture of the normal lung correlated with anatomical studies S Rood and asbestosis is concise, clear and complete The experimental pathology of silicosis and asbestosis is dealt with by Leroy U Gardner in a fascinating manner E L Middleton discusses ably the complicated occupational, preventive and legislative aspects of silicosis and asbestosis in Great Britain, and A J Lanza presents a similar picture of the position in the United States For the sake of completeness chapters on the preventive and legislative aspects of the pneumoconioses in South Africa, Australia and other countries might with advantage have been included

The editor and his contributors are to be congratulated on the successful production of this important book They have carved out of the chaotic mass of silicosis literature a form which can be appreciated and perhaps understood by all workers in the field of industrial pulmonary diseases

Clinical Pathology

(4th ed) By P N Panton, M.B Camb , clinical pathologist to the London Hospital, and J R. Marrack, M D Camb , professor of chemical pathology in the University of London, and chemical pathologist to the hospital London · J and A. Churchill 1939 Pp 502 10s

It is no mean feat to crowd, as this book does, almost the whole of clinical pathology including histology and media making into 502 pages But the book loses a little by its excessive conciseness For example, although liver therapy by mouth is mentioned, there is no reference to the valuable extracts now given by injection In discussing the use of the colorimeter, the increased accuracy to be obtained with the use of colour filters is not mentioned, nor does the note on the sedimentation-rate mention the errors due to excess oxalate It would have been helpful if the simpler and quicker methods mostly used for the estimation of sugar and chloride in the cerebrospinal fluid had been described There are also one or two loose statements such as "Into seven large test tubes in a rack put 0 1 c cm of complement in tubes I to IV" But there is no cause for major criticism, and many practical points are brought out here which are omitted from larger works The book will be a valuable addition to the library of any clinical laboratory

Guiding Principles for Studies on the Nutrition of Populations

By Dr E J Bigwood, professor at the University of Brussels London Allen and Unwin (League of Nations Publications Department) 1939 Pp 281 6s

The whole subject of how to assess the nutrition of people is clearly, concisely, and adequately covered in this book, and although the author is critical and sceptical, he none the less is convinced of the possibility of the task The author wisely states that the absolute minimum period of investigation for individual households is one week Wherever possible this period should be exceeded With the household-book method it is advisable to extend the period to about a month He makes clear the often forgotten distinction between two categories of waste—household waste and physiological waste The former includes everything which escapes consumption, the latter consists of substances eliminated by the organism as the result of imperfect utilisation on its part The importance of defining conditions of calculation in making a physiological analysis of nutrition surveys and of calculating the ratio of animal proteins to the total proteins are emphasised The international units of the vitamins are given and their relations to other superseded units, and the present day assessment of the units is described Prof Bigwood assesses the vitamin B_1 requirement of the adult at 300 I U per day, of the child of preschool age at 200 to 250 I U per day and of an infant at 10 to 15 I U per 100 calories This will cause some heart burnings among the B_1 fanatics There is an admirable chapter on statistics

and no-one after reading it need be frightened by the jargon of the statistician

The rest of the book deals with the methods of discovering at the earliest possible moment the effects of the "highly unsatisfactory state of nutrition of a large part of the population of various countries," described in the Health Section (League of Nations) Report of 1932 The author believes that simple height and weight measurements *may* have some use in assessing nutrition, but discards all the more complicated indices of Quetelet, Manouvrier, Pirquet and others. He has little use for the subjective scales of assessment of nutrition utilised by the British Board of Education and the Ministry of Health, and very naturally quotes R. H. Jones's statistical attack on this method of assessment. The author inclines to the accurately measurable signs of deficiency as a means of assessment. He would use photometry for vitamin-A deficiency, the phosphatase test for vitamin-D deficiency and either the vascular resistance or the body saturation test for vitamin C He admits that these detailed investigations take much more time and skill than the nutrition surveys, and concludes that it will be necessary to combine dietary surveys and inquiries into the state of nutrition covering the same population groups

Most nutritional workers will agree with his preference for estimations of the lack of the vitamins, for while it is rare to find a lack of calories and proteins with a first-class supply of the protective foods, it is common to find a satisfactory supply of calories and proteins with an almost total lack of the protective foods

To everyone interested in research in, or in the teaching of, dietetics this excellent book is indispensable

Frustration and Aggression

By JOHN DOLLARD, LEONARD W. DOOB, NEAL E. MILLER, O. H. MOWRER, ROBERT R. SEARS. London: Humphrey Milford, Oxford University Press. 1939. Pp. 190. 9*s*.

It is a pleasure to find clinical psychology applied to social issues in a genuinely scientific way. The authors of this book, which is published in America for the Institute of Human Relations, take as their fundamental working hypothesis the relatively familiar theory that aggression is due to frustration and then proceed to a systematic study of aggressive behaviour to see how far this theory will require modification. An integral part of their theory is the view that frustration must always be considered in relation to instigation—namely, to what extent a desire has been stimulated. Thus not being able to afford a wireless set is a condition much more frustrating to an Englishman than to an Eskimo.

The severe frustrations imposed on children from their earliest years, the special frustrations of adolescence, and the frustration inevitable in a social life whatever the form of government are all considered scientifically and in detail with much reference to conditions in the more primitive societies. The authors make tentative attempts to correlate these frustrations with outbursts of aggression In this they make use of such concepts of clinical psychology as repression, displacement, self-frustration and self-aggression In a particularly interesting chapter they review the many and diverse factors found to correlate with criminality (itself a form of aggression), and make out a good case for regarding them all as indicating a higher degree of frustration than the average.

There is one type of aggression which is not discussed and which will probably need consideration in further studies. This is the tendency to see internal frustrating forces as external—to project internal frustrations on external persons or institutions and attack them there. This seems to be the chief omission in a book whose merit lies in its insistence on an economy of theory and in its serious and mostly successful attempts to group and explain a great variety of apparently discrete phenomena.

Forensic Medicine

(3rd ed.) By DOUGLAS J. A. KERR, M.D. Edin., F.R.C.P.E., D.P.H., lecturer on forensic medicine in the school of medicine of the Royal Colleges, Edinburgh. London: A. and C. Black. 1939 Pp. 331. 15*s*.

THE secret of this book's success with the student is easy. It is lucid, confines itself to matters of practical value, and is magnificently illustrated. Furthermore, it is unburdened with profuse or aged references and is fresh both in matter and style. The author has the knack of presenting essentials in a few simple phrases, and he outlines the law's relations to medicine in such clear perspective that forensic medicine begins to look like the mere application of common sense.

In this edition the book has been improved without lengthening it appreciably Changes necessitated by alterations in the law such as the Infanticide Act 1938, or introducing new matter as under the Matrimonial Causes Act 1937, have been made, the section on professional secrecy has been rewritten, and the entire text has clearly been revised in some detail. A stray error has crept into the table outlining the maturity of the fœtus, where the 5th-month features read in error, the important calcaneus centre is post-dated by two months and there is no mention of other vital ossification centres

The book remains nevertheless a competent and attractive outline of the subject.

Encyclopædia of Sex

By GEORGE RYLEY SCOTT, F.Z.S., F.Ph.S. Eng., F.R.A.I. London: T. Werner Laurie. 1939. Pp. 352. 21*s*.

It was Havelock Ellis, to whom this volume is dedicated, that subjected the manifold expressions of the sexual impulse to an analysis so searching that he can be said to have converted his subject into a science The complexities which he disclosed necessitated an elaboration of the previously somewhat scanty terminology, and the literature of psycho analysis has added many words more Thus encyclopædia is therefore not inopportune, and Mr. Scott has performed his difficult task with skill In a preface he points out that his book, while suffering from the limitations of being a one-man work, also derives certain advantages from its single authorship. The longer articles have a consistency and unity which are absent from a symposium, however skilfully edited.

The contents are arranged in alphabetical order, some of the terms being merely defined as in a dictionary, while others are treated at length. Curiously enough, though archocystocolposyrinx and terms equally unfamiliar are included, the important word sublimation is omitted The author makes no attempt to disguise his personal views: indeed, he sometimes expresses them with almost excessive vigour. But Mr Scott's approach will give offence to nobody except perhaps the advocate of complete sexual liberty.

THE LANCET

LONDON · SATURDAY, JULY 22, 1939

CARBOHYDRATE METABOLISM

No disease has a background more tantalising than that of diabetes mellitus Long before BANTING and BEST made their famous preparation of insulin the importance of this substance was realised and its discovery predicted In the therapeutic field its success was dramatic, yet in spite of his foreknowledge the physiologist had no niche for it as had the astronomer for a new planet or the chemist for a new element Insulin supplied a known deficiency because in its absence the machinery of carbohydrate metabolism laboured painfully and wastefully on the brink of disaster, while in its presence the wheels ran sweetly and without stress, but the deficiency had not been set out in precise terms, and to this day the manner in which insulin performs its miracle is matter for controversy In the meantime much has been learnt and the sum of all this knowledge is set out by Professor HIMSWORTH in his Goulstonian lectures, the last instalment of which appears in our present issue His own work is a worthy link in a chain of important contributions to medicine, typical of the present day, in which the physiological background of therapeutic advance is explored by controlled observations on human subjects, reinforced by laboratory investigation and animal experiment

Let us attempt to set out in a few words the point that has been reached In the absence of the liver, sugar disappears from the blood stream, showing that this organ is responsible for the conversion of the foodstuffs, and if necessary of the tissues of the body, into glucose Perhaps insulin controls its output and diabetes is due to its unchecked activity The liver is a notoriously difficult organ to study experimentally, but there is evidence that in diabetes it is producing more glucose than normally, and it certainly then disobeys its normal rule of curtailing production when the blood-sugar tends to rise in concentration It cannot lightly be dismissed as not guilty On the other hand there is excellent evidence, as HIMSWORTH points out, that in diabetes the peripheral tissues use less glucose than normally Here, so in effect he argues, is a strange coincidence One would expect under-utilisation of glucose by the tissues to relieve the drain on the blood sugar, and therefore the demand on the liver Is it likely that the tissues and the liver should each act abnormally in a direction which increases the blood sugar concentration, thus simultaneously losing its inhibitory effect on hepatic glycogenolysis? The synchronous disintegration of a system in this way is not intellectually satisfying HIMSWORTH's own investigations have led him to a different interpretation He advances the view that the relative inability of the tissues to use glucose in the absence of insulin is at the root of the trouble, the high level of blood-sugar is a physiological adjustment giving the tissues a bigger "head of pressure" of glucose with which to work It is known that this increases their power to make use of it When the adaptive concentration surmounts the renal threshold the output of the liver must increase by leaps and bounds, for it must maintain this concentration and at the same time make good the leakage through the kidneys The evidence for this theory, which has the merit of coherence, is ably presented by HIMSWORTH, though he has yet to find the nature of the stimulus transmitted to the liver from the embarrassed tissues Whatever it is, it must take precedence over the mechanism by which the liver is said to respond correctively to a rise or fall in the actual blood-sugar concentration The careful experiments of SOSKIN and his colleagues purporting to establish such a mechanism fail to exclude the possibility of a "message" direct from the tissues to the liver HIMSWORTH suggests the brain as the most sensitive tissue

Whatever the outcome of this part of the story, it is now certain that the mere presence or absence of insulin is by no means the only thing to be considered The sensitivity of the body to insulin can alter considerably, it varies, for instance, with the carbohydrate content of the diet This can only mean a second variable factor at work, the abnormal operation of which might well result in a pathological insensitivity to insulin and a different type of diabetes. It is now commonly accepted that an insulin insensitive kind of diabetes has been established, HIMSWORTH, who has himself made large contributions to the study of insulin sensitivity, claims to be able to distinguish it by a clinical test from that due to insulin lack The nature of the second factor is not quite certain, indeed, it may not be a single entity In theory, it could be something which aids or something which impedes the action of insulin, the evidence for its presence being merely the power it has of influencing the latter In practice, our thoughts fly to the anterior lobe of the pituitary gland, which has become so important in carbohydrate metabolism since HOUSSAY showed how its removal ameliorates experimental pancreatic diabetes in animals Here, however, we find ourselves confronted with problems no less baffling than those relating to insulin itself Does the anterior pituitary act on the liver, the peripheral tissues, or both? What is its exact relation to insulin? HIMSWORTH stresses the importance of the evidence associating it with the liver in the production of glucose from non-carbohydrate sources In its absence, any extra ordinary demand by the tissues for glucose is not met, and when it is removed from the diabetic dog the compensatory rise of blood sugar concentration fails to take place

It has been shown that pituitary extracts will cause glycosuria, YOUNG has produced permanent diabetes in dogs by a course of anterior pituitary

injections. The pancreatic lesions found in these cases might be explained by overaction of the islets in response to the excessive mobilisation of glucose by the liver, but YOUNG has also found a pituitary fraction which antagonises insulin while having no influence on blood-sugar level. This apparent versatility on the part of the anterior pituitary is a deterrent to rash speculation, though fortunately it introduces no incongruities. LONG and his colleagues have implicated the suprarenal cortex in the story, and so discoveries follow each other faster than they can be assimilated It is too much to expect of any modern theory that it should accommodate all the known facts, but sooner or later gross surprises must become fewer, and the field be worked over again carefully to test the more comprehensive hypotheses. Of these the one put forward by Professor HIMSWORTH must rank among the most important.

SPIROCHÆTE AND WASSERMANN REACTION

THE significance of the Wassermann reaction has often been questioned on the ground that it is not a specific test since the reagin (antigen) used is as a rule an alcoholic extract of heart muscle and not the *Treponema pallidum*. Modern improvements in the technique of spirochæte cultivation have made it possible to investigate this criticism from a new angle, and the work done in the last two years by BECK[1] at the London County Council laboratories provides a more firm basis for argument. Employing a standard Wassermann technique he tested 1100 sera in parallel, using as a reagin in the one case an alcoholic extract of heart muscle and in the other a carbol-saline suspension of five strains of cultured spirochætes. Out of 542 sera from known syphilitic patients the two reactions agreed in 80 6 per cent. Of the remainder, 14 8 per cent. gave a positive spirochætal complement-fixation (Sp C.F.) reaction with a negative Wassermann reaction, and 4·6 per cent a negative Sp C F. reaction with a positive Wassermann reaction. The control group of 496 non-syphilitic sera gave a positive Wassermann reaction in 1·2 per cent and a positive Sp C F. reaction in 1 6 per cent On comparing these findings with the clinical histories of the patients it was found that the Sp.C.F. reaction was the more sensitive in all stages of syphilis and especially so in the late latent stage While admitting the doubtful identity of the spirochætes from which the antigen of the Sp.C.F. reaction was obtained it seems clear from their practical value in the Wassermann reaction that a definite antigenic relationship exists between them and the *Tr. pallidum*. This view is also supported by the experimental evidence of their specific behaviour.

In experiments designed to show the specificity of the Sp.C.F. reaction the spirochætes were grown in a medium containing no liver, thus avoiding any non-specific antigenic action due to liver contaminants. Of the two non-spirochætal antigens used, negative reactions were obtained with 48 sera (21 of which were positive with the Sp.C F. reaction) when an antigen prepared from *Corynebacterium diphtheriæ* was used Using a *Leptospira icterohæmorrhagiæ* antigen, only 1 weakly positive result was obtained with 102 sera, 45 of which were positive to the Sp C F. reaction. With the closely related *Spirochæta dentium* a definite antigenic reaction with syphilitic sera was obtained A total of 773 sera were tested in parallel using the Sp.C F. reaction antigen and one made from the *Sp. dentium*. Of 407 syphilitic sera tested, 42·7 per cent reacted positively and 27·8 per cent. negatively to both antigens, while 29 5 per cent. reacted positively with the Sp.C F. reaction but negatively with *Sp dentium* antigen. Thus of the total of 72·2 per cent positive sera recorded by the Sp C.F. reaction 59·2 per cent. were also positive to *Sp. dentium* antigen At the same time, the latter antigen showed a tendency to give non-specific positive reactions (4 4 per cent) with the 366 non-syphilitic control sera. From these results an antigen prepared from the *Sp. dentium*, though much less sensitive than that used in the Sp C F. reaction, appears to have a definite antigenic relationship to the *Tr. pallidum*.

On comparing the antigenic value of the five strains of cultured spirochætes used in this investigation, they were found to be approximately equal in sensitivity and specificity with the exception of the *Sp dentium* which was definitely less so in both respects The serological structure of these five strains of spirochætes was demonstrated by means of cross-agglutination, complement-fixation and absorption tests with antisera prepared against them It appeared that there were four types present of which the *Sp. dentium* represented one. By similar tests parallel serological differences were found to exist in the antibody structure of the patients' sera reacting with these strains. Thus it was found possible to separate the antibody reacting with the standard Wassermann antigen (extract of heart muscle) from the spirochætal antibodies, and also to differentiate between each of the spirochætal antibodies themselves. During this part of the investigation it was found that with a syphilitic serum a positive reaction obtained with a *Sp dentium* antigen was abolished by absorption of the antibody by any of the other spirochæte strains. The converse however did not hold. At the same time, absorption by non-spirochætal antigen (*C diphtheriæ* and *Lept. icterohæmorrhagiæ*) did not suppress the positive reaction with syphilitic sera given by the *Sp. dentium* antigen. It is therefore probable that some specific factor is at work when a *Sp. dentium* antigen reacts with syphilitic serum. The next step was to show the nature of the spirochætal antigen. An alcoholic extract of spirochætes, a carbol-saline suspension of whole spirochætes, and the Wassermann antigen (heart extract) were added to separate portions of syphilitic sera and subsequently tested against these antigens. It was found that on mixing the positive syphilitic serum with the alcoholic extract of spirochætes or the Wassermann antigen the homologous antibodies were removed and there was no fixation of complement when using these

1. Beck, A., *J Hyg., Camb* May, 1939, p 298

extracts as antigens, but that when a carbol-saline suspension of whole spirochætes was used as an antigen against the same sera the result was positive A parallel result was obtained if the sera were mixed with the carbol saline suspension of spirochætes and then tested against the three antigens BECK concludes that the spirochæte contains two antigens—namely, the "ubiquitous" lipoid antigen of heart muscle and other tissues, and a specific antigen which is not extracted by alcohol in sufficient quantities to be shown by absorption tests It was found impossible to isolate this specific antigen until the method of tryptic digestion used by RAISTRICK and TOPLEY in the preparation of paratyphoid antigens was adopted A fraction (termed F68) was obtained from the spirochætes and this reacted strongly with antispirochætal sera but not with syphilitic sera BECK suggests that a combination of the F68 fraction with a non specific "intensifier" of lipoid nature is necessary to bring about reactivation, since an extract of the trypsin-digested spirochætes is actively antigenic before the addition of the alcohol necessary to precipitate the F68 factor It would be interesting to know if cholesterin would act as a reactivator of this antigenic fraction

This work will undoubtedly stimulate fresh interest, and it makes still more obvious the need for a way of isolating, cultivating and identifying the *Tr pallidum* beyond all question It should then be possible not only to produce a truly specific Wassermann reaction but also to gain some understanding of the rôle of the alcoholic extract of heart muscle in the present Wassermann technique

DIPHTHERIA IMMUNISATION IN GUERNSEY

A SCHEME of immunisation against diphtheria has been introduced this year in the island of Guernsey (including the islands of Herm and Jethou), the fruits of which will certainly be examined carefully in time to come In studying the scheme, and its results in the future, the island's recent history of diphtheria is both relevant and interesting The reports of the late medical officer of health, Dr H D BISHOP, show that it experienced a prolonged epidemic in the years following the late war This was succeeded by a period of slowly declining incidence, until from 1932 to 1936 the disease was almost absent from the island Among some 10,000 children below the age of fifteen only 22 cases were notified during these five years Under such conditions a susceptible population was built up and a fresh epidemic naturally developed In 1937 some 60 cases were registered, and in 1938 the epidemic reached an extremely high level, unprecedented in the island's records of the present century, nearly 500 cases being reported with 14 deaths

To this unfortunate experience the board of health responded with a compulsory scheme for inoculation, which was accepted by States early in 1938 and confirmed by Order in Council in March, 1939 In the interval caused by the necessary legal procedure free inoculation was offered by Dr R W REVELL, the present medical officer, to those ready to take advantage of it, and by the end of 1938 as many as 3500 children had been immunised The compulsory order of 1939 applies to all children who were between the ages of two and ten years on April 15 last, and in future years to all children as they reach the age of two In course of time, therefore, virtually the whole population will have been inoculated in early childhood So far some 6000 inoculations have been performed, comprising nearly all the children between two and ten, with volunteers of other ages The prophylactic chosen is alum-precipitated toxoid (A P T), which is being given in two doses at an interval of not less than 13 days nor more than 28 days, the first dose being 0·2–0·5 c.cm., at the discretion of the medical practitioner, and the second dose 0·5 c.cm Inoculation is performed by the medical practitioners of the island, as appointed for the purpose by the States board of health, supplies of A P T being provided to them free of charge The practitioners are paid half a crown in respect of each administration—i.e., five shillings per completed inoculation—and are required to return details of each inoculation on prescribed forms From these records it will be possible to gather valuable information as the years pass, relating to the children's ages when inoculated and their subsequent history as regards diphtheria According to last year's records there were 10 cases of mild type among some 3000 immunised children It is also reported that there was a rapid fall in the general incidence of the disease towards the end of January, 1939—some months earlier than the expected seasonal decline—and at the present time only an occasional case is developing The main interest of the scheme must lie, however, in the future, over the next ten years or so

It is notoriously difficult to disentangle cause and effect in inoculating during an epidemic prevalence, and less obvious problems of the duration of exposure to risk complicate simple comparisons between the experiences of the inoculated and uninoculated In most places, too, it is hard to relate the secular trend of diphtheria to the incidence of inoculation, for the latter tends to fall, under a voluntary scheme, when the disease and the fear it engenders are absent, and thus a new susceptible population accrues Such a falling-back will not take place in Guernsey with its inoculation year by year of all children as they reach the age of two, and the crucial evidence will be the absence of the epidemics that might be expected to recur at intervals in its small and partially isolated community Voluntary immunisation might well, and doubtless will, be offered at a rather earlier age than two—towards the end of the first year of life—and also, at present, to children over ten, the interval between doses might, perhaps, on the available evidence, be made to approximate to the higher limit of four weeks rather than to the lower limit of two These, however, are relatively minor points On the general issue, Dr REVELL and the Guernsey authorities are to be congratulated on the firm action they are taking to eradicate diphtheria in epidemic form from the island

ANNOTATIONS

THE GLUTAMIC ACID OF TUMOUR PROTEINS

Kögl and Erxleben [1] lately presented evidence that some of the amino-acids of malignant-tumour proteins are partially racemised and that the effect is greatest in the case of glutamic acid. These findings suggested an essential difference between the proteins of normal and of malignant tissues and enabled hypotheses to be put forward regarding the mechanism of malignant change Special importance therefore attaches to a communication from Chibnall and his collaborators,[2] who have sought to confirm the new observations. They have hydrolysed proteins derived from Crocker mouse sarcomas, a human carcinoma of the bronchus and a human carcinoma from the neck, and have separated the dicarboxylic-acid fraction by a modification of the calcium-salt method of Foreman; and in each case the glutamic-acid hydrochloride ultimately isolated in good yield showed the optical rotation characteristic of the usual l(+) glutamic-acid hydrochloride. To these English findings Kögl and Erxleben reply [3] that the method of fractionation employed by Chibnall may not lead to the eventual isolation of partially racemised glutamic-acid hydrochloride if this is present. They emphasise that there is an essential difference in the solubilities of the two forms of glutamic acid, both as the calcium salt and as the hydrochloride, and state that the *d*-form has a greater solubility than the *l*-form. Consequently they consider that only the *l*-form would have been isolated under the conditions used by the London investigators. In an attempt to confirm this, they added known amounts of *d*-glutamic acid to protein hydrolysates from normal tissues—which should contain only *l*-glutamic acid—the mixture being then submitted to fractionation via the calcium salts The glutamic-acid hydrochloride they isolated in this way had the normal rotation Kögl and Erxleben further say that they have now succeeded in isolating *d*-glutamic acid itself from the partially racemised hydrochlorides obtained from Brown-Pearce tumour, which indicates that the low rotation of these latter products cannot have been due to the presence of impurities with a rotation of the opposite sign A further statement from Chibnall and his colleagues will be awaited with interest.

VASODILATOR DRUGS IN RAYNAUD'S DISEASE

THE knowledge that Raynaud's disease results from a spasm of the digital arteries encourages the constant hope that a suitable vasodilator drug may be found to relieve it The perfect drug for the purpose would maintain an adequate blood-supply to the hands for many hours even though they were meanwhile exposed to cold; it would have no undesirable effects on other parts of the body, and it would be easy to administer. Nitrites have too transitory an action, as also have the acetylcholine derivatives unless administered by the cumbersome and somewhat difficult method of electrolysis; and recently [4] papaverine hydrochloride has been advocated, though to be effective it must be injected intravenously The value of all such complicated forms of treatment is questionable, because the patient is apt to decide that she prefers cold fingers to a very frequent attendance on her doctor for intravenous or electrical treatment. It has also been shown [5] that the simple procedure of warming the body—for example, in a hot bath—increases blood-flow in the hands just as effectively as iontophoresis with drugs The hot bath serves at least as a convenient control in judging the value of the newer, more complicated and expensive methods.

"HEALTH FOR 7,500,000 PEOPLE"

New York city is the largest health unit in the world, for though England's metropolis contains a somewhat larger population its health services are divided whereas those of Greater New York were unified by charter in 1901, when they were placed under a board of health consisting at present of seven members, five of whom are medical men. The American system of public-health administration differs considerably from ours and formerly was subject to political influences, but of recent years the system has been made much more stable and in New York especially the machinery is now as efficient as any in the world. A full account of the method of health government is given in the report of the commissioner, Dr. John L. Rice, for 1937, which contains a review of progress over the five years 1934–38. During this period the cost of the service has varied from 4¼ to 5 million dollars annually, but the New York citizen does not grudge the money, and since La Guardia has been mayor the success of the department has been so great as to bring conviction that money spent on health is soundly invested The death-rate of New York in 1937 was 10·4; the infantile mortality dropped steadily from 53 in 1933 to 44 in 1937, tuberculosis mortality (per 100,000) fell from 64 to 57, and maternal mortality (per 1000 births) from 6 to 4 The last rate is computed somewhat differently from ours and the New York figure of 4 is about equal to a London rate of 3. The five-year period has been one of rapid development in the health programme; the city is divided into 30 districts of which, at the end of 1937, two-thirds were completely organised. Though the Americans have a legal health code even more complicated than ours, they use it less. "Modern public-health administrations," Dr. Rice remarks, "makes relatively little use of police measures and carries on most of its work through health education." New York in fact claims to be the pioneer of educating people to look after their own health rather than trying to enforce health by legislation—and it may be granted that its health propaganda has been remarkably successful Two points in the American system which are superior to ours are the efficiency of the laboratories for clinical diagnosis, especially in connexion with the differentiation of types of pneumococcus, and the length of the list of diseases compulsorily notifiable. Three groups of diseases trouble New York more severely than they do London—the pneumonias, diabetes, and heart disease in early middle age. In 1937 pneumonia was charged with 6504 deaths in New York against London's 3477 and diabetes with 2669 against London's 655. In New York all fœtal deaths are reportable; of 4802 abortions notified to the department in 1937 some 25 per cent were embryos

1 Kögl, F., and Erxleben, H., *Hoppe-Seyl Z* 1939, 258, 57, see *Lancet*, May 6, 1939, pp 1049 and 1080
2 Chibnall, A. C., Rees, M. W., Tristram, G. R., Williams, E. F., and Boyland, E., *Nature, Lond* July 8, 1939, p 71
3 Kögl and Erxleben, *Ibid*, July 15, p 111
4 Mullinos, M. G., Shulman, I., and Mufson, I., *Amer J med. Sci.* June, 1939, p 793
5 Montgomery, H., Holling, H. E., and Friedland, C. K., *Ibid*, 1938, 195, 794

of less than 20-weeks gestation, as however 83 per cent of all abortions are reported from hospitals it is probable that many early abortions are missed

MORE PAY FOR MENTAL NURSES

THE London County Council has decided to increase the pay of both male and female nurses in its mental hospitals, and to increase holidays Male hospital assistants and male nurses of all grades between staff nurse and head nurse are to be granted an increase of 3s a week, and an increase of 2s a week will be granted to women hospital assistants and women nurses between staff nurse and sister The annual leave for head nurses and sisters is to be increased to 4 weeks—one week more than staff under their immediate control The additional expenditure will be £10,580 in 1939-40 £22,835 in 1940-41 and about £19,313 in each subsequent year These increases are fully justified The apparently lavish pay of the female mental staff nurse of 46s a week suffers a large compulsory deduction for board and lodging, and the advent of women social workers and occupational therapists on professional salaries has caused much heart burning among mental nurses The council's action should remove grumbles and help recruitment

PULSUS ALTERNANS

OF late years little attention has been paid to pulsus alternans, either as a guide to prognosis or as a guide to the mechanism of heart failure, yet it has never been adequately explained. The earlier observations of Wenckebach [1] suggested that at the end of the smaller beat blood remains in the heart, so that the diastolic filling and the initial tension of the fibres at the beginning of the next beat are greater, and therefore the heart—working at a better mechanical advantage—empties more completely At the next beat diastolic filling and initial tension are smaller and a feebler beat results More recently Green [2] has shown that derangement of one portion of the myocardium may give rise to alternation With an electromagnetic clamp he was able to exclude a main coronary artery of the dog for part of the cardiac cycle so that the blood supply was impaired though not entirely suppressed In a number of hearts so treated alternation took place, and by means of optical myocardiograms it was shown that during the smaller beats the affected areas contracted only slightly if at all. Thus it seems possible that alternation in the mammalian heart may arise from a relative failure of the whole or a portion of the heart to contract at alternate beats

In using pulsus alternans for prognosis the first essential is to be able to decide when it is present Only in cases where it is pronounced can it be recognised by palpation of the radial pulse Though it becomes apparent when the radial pulse is graphically recorded, this entails the use of apparatus to which few are accustomed, and actually the alternation may be equally well discovered by careful attention when taking the blood pressure As the cuff pressure is being lowered, there is a stage at which only each alternate beat can force its way through, then when the pressure is further lowered to the second systolic level all beats come through, so that the cardiac rate appears to be abruptly doubled The degree of alternation may be expressed as the difference between the two levels, in millimetres of mercury Occasionally the alternation only appears for a few beats after an extra systole or when the heart is beating rapidly Occasionally it may be seen in the electrocardiogram and still more rarely it appears in the electrocardiogram though it cannot be detected in the pulse [3] Pulsus alternans is to be distinguished from alternate extra systoles by the fact that in alternation the beats are regular, whereas in extra systoles a longer pause follows the shorter beat White [4] found the condition in a third of all cases showing any degree of cardiac failure and in 71 of 300 cases with cardiac or cardiorenal disease From the standpoint of prognosis, he said, patients with pulsus alternans should be divided into two groups The first consists of those in whom it is associated with a very rapid heart rate (e.g., in paroxysmal tachycardia), in this group its presence does not seem to affect the prognosis The second group is that in which the heart rate is relatively slow, and here it is of serious significance Thompson and Levine [5] observed over a twelve year period 117 patients with constant pulsus alternans, the date of death of 71 being known Of this series the 50 males lived an average of seventeen months after the detection of the abnormality, and the females eight and a half months Only 5 of the 71 patients were under forty and in them the average duration of life was only six months after the detection of the abnormality, generally speaking it was found that the seriousness of the sign decreased with the increase in age of the person in whom it was detected

Such an easily elicited and important sign of failure of the left ventricle should be carefully looked for in all cases of hypertensive heart disease, coronary thrombosis and luetic aortitis

1 Wenckebach K F, and Winterberg H. Die unregelmässige Herztätigkeit, Leipzig, 1927
2 Green H D. *Amer J Physiol* 1936 114 407
3 Hamburger, W W, Katz L N, and Saphir O. *J Amer med Ass* 1936 106 902
4 White P D. *Amer J med Sci* 1915 150 82
5 Thompson W P, and Levine S A. *Amer Heart J* 1936, 11 135
6 The hon secretary of the association is Dr J Glyn-Jones Wilson medical officer of health for Cardiff

BEDBUGS IN SHIPS

THE Association of Port Health Authorities of the British Isles has issued [6] a pamphlet on the prevention of infestation of ships by bedbugs, illustrated with a coloured plate reproduced from Memo 180 Med of the Ministry of Health Bedbugs can be a worse nuisance on board than they are ashore, but owing to the confined nature of cabins infestation is easier to prevent Introduction can only occur at ports, mainly through the clothing of the crew, inspection and personal cleanliness can prevent bugs from reaching the quarters. Even should they do so, infestation is unlikely to result if the quarters are kept scrupulously clean and if attention is paid to nooks and crannies which might afford suitable cover This is less difficult in ships than it is in houses Should infestation occur from neglect of the cleanliness requisite to prevent it, disinfestation must be adopted The pamphlet recommends fumigation with sulphur dioxide which is safe but not always efficient, or with hydrogen cyanide which is highly dangerous but efficient if carried out properly Fumigation with cyanide is only practicable in port in a ship temporarily laid up and carried out by experts An old boat badly infested may be as impossible to free as is an old house, but even a reasonable degree of cleanliness together with attack on the first sign of infestation should be sufficient to assure freedom The moral is clear enough As with all insect pests, it is comparatively easy to prevent bugs from getting a foothold, but once they establish themselves they are

exceedingly difficult to exterminate. The new agreement (July 1) between shippers and seamen to coöperate in ensuring the cleanliness of crews' quarters should go a long way towards ridding the merchant service of a preventable evil.

TREATMENT OF ACUTE CHOLECYSTITIS

THE best time for operation in acute cholecystitis is debated by Ehnmark in a monograph entitled the gall-stone disease[1] Surveying the fluctuation of surgical opinion, he shows how at one time acute cholecystitis has been treated as an urgent surgical emergency, while at others operation has been postponed until the acute symptoms have subsided As early as 1903 Riedel advised operation within twenty-four hours of the onset of the attack; by 1920 operation during the interval was widely supported, both in this country and in Germany; while from that date onwards an increasing number of surgeons in German and in Scandinavian countries, Ehnmark finds, insisted on surgical treatment in the acute stage Still later more support has been shown for operation after subsidence of the attack, but in Scandinavia opinion seems to have remained very much divided The one item on which Ehnmark finds general agreement is that grave cases, with pronounced peritoneal irritation or with perforation, ought to have immediate operation unless the patient's condition is hopeless For cases of less severity there are at present three opinions operate at once, as for appendicitis; wait a few days, till the most acute symptoms have subsided; operate only after the attack has passed, when the temperature and pulse are normal, the abdominal tenderness has gone, and the patient is eating and is feeling pretty well Ehnmark thinks that surgeons who advocate postponement till the morbid process is at an end are offering a theoretical opinion on which they could not act in practice To obtain complete healing takes so long—several weeks or months—that the patients would be discharged from hospital, and would be unlikely to consent to readmission at the desired time He himself proposes the term "clinical interval" to designate the stage of the disease in which temperature has become normal, abdominal symptoms and possible jaundice have disappeared, and the patient may be allowed out of bed From his own careful analysis of 257 operations for acute cholecystitis performed in the surgical clinic of the University of Uppsala, he is convinced that operation is best performed in this clinical interval

The most significant feature of the Uppsala figures is the drop in operative mortality in the cases treated during the last period under survey—namely, 1932–35. In the first two periods (1922–27 and 1928–31) it is about equally high (14 8 and 13 3 per cent respectively), but in the third it has dropped to 3 5 per cent Having tried to examine all the factors that could have contributed to this result Ehnmark is persuaded that the sole significant change was that during the years 1932–35 the patients were operated on in a later stage of the disease, or after a longer time in hospital Since 1932 almost all the moderately severe cases have been operated on in the clinical interval, whereas before that date most of them were operated on while the attack was in progress Even of the severe cases, less than half have, since 1932, had the operation in the acute stage, whereas in 1922–31 it was the exception to wait

Severe acute cholecystitis Ehnmark regards as a disease with a high mortality In the worst cases, although the risk is great, he thinks immediate operation is right, unless the condition is quite hopeless. Cholecystostomy is then his choice In other cases it is reasonable to expect spontaneous improvement, and cholecystectomy undertaken during the "clinical interval" bears, in his opinion, a comparatively small risk It is not the practice in Uppsala to operate for the first attack, unless life is in danger.

DEATH OF A GORILLA

"Moina" only survived the death of her spouse "Mok" for about seventeen months She refused food, lost interest in life, and became savage with her keepers when roused In May she developed cracks and abrasions on her hands and feet which she picked and gnawed until they became large septic sores; these it was impossible to dress or treat otherwise than by squirting antiseptics on them through the bars of her den Finally gangrene of the right foot and leg developed and she died of sepsis and toxæmia from the gangrenous leg At the post-mortem examination Colonel A. E Hamerton, pathologist to the Zoological Society, could find no pathological lesions others than those associated with septicæmia Histological examination of the peripheral arteries and nerves has not so far revealed anything to account for the primary lesions on hands and feet These, he thinks, were probably traumatic in origin

CLINICAL APPLICATIONS OF TESTOSTERONE

THE last few months have seen several attempts, especially in the United States, to multiply the uses of testosterone In view of the resemblance between many androgens and progesterone, Rubinstein and Abarbanel[1] have tried testosterone propionate for dysmenorrhœa, and report complete relief in 16 out of 26 cases, and partial relief in 4 The patients that benefited were those with "essential" dysmenorrhœa, attributed largely to hormonal imbalance, and in those with structural abnormalities of uterus or tubes the symptoms were sometimes made worse The remedy works, it is supposed, by depressing pituitary gonadotrophic secretion, reducing the formation of œstrogen, and favouring luteinisation and the progestational response of the myometrium

In a different field Edwards, Hamilton and Duntley[2] claim to have used testosterone propionate with success in the treatment of organic disease of the peripheral vessels This use of the hormone was first suggested by its general vascular effect on the skin—arterialisation in such regions as the head palms and soles, as revealed by a recording spectrophotometer—and benefit is reported in three men with thrombo-angiitis obliterans and in four cases of arteriosclerosis In reviewing the undisputed clinical uses of testosterone, Kearns[3] concludes, first, that it is an effective means of substitution therapy in castrated or cryptorchid patients, and secondly, that injunction of free testosterone in a greaseless base is as effective as intramuscular injection of the propionate The injunction of male hormone which has been studied in this country by Foss[4] is deemed

1 The Gall Stone Disease, by Ernst Ehnmark, *Acta chir scand* 1939, 82, suppl 57

1 Rubinstein, H S, and Abarbanel, A R, *Amer J Obst. Gynec* April, 1939, p 709
2 Edwards, E A, Hamilton J B, and Duntley, S Q, *New Engl J Med* Mar 23, 1939, p 865
3 Kearns W M, *J Amer med Ass* June 3, 1939, p 2255
4 Foss, G L, *Lancet*, 1938, 2, 1284, 1308, 1939, 1, 502

useful because it imitates the steady, continuous androgenic action of normal testes, and because it obviates frequent contact with the physician

THE HANDS OF THE AMATEUR GARDENER

THE Manchester city coroner has been warning gardeners of the danger of wounds contaminated with manured soil. The case that inspired his comments was that of a solicitor's cashier who pricked his finger while tying up roses and died soon afterwards from infection of the finger. Scratches and pricks of this kind are almost inseparable from gardening, and the question is how far these wounds must be taken seriously. In his first acquaintance with the casualty department of his hospital, the student learns that wounds contaminated with soil are regarded with concern because of the possibility of infection with the organisms of gas gangrene or with tetanus spores that will become active in damaged tissues. Wounds severe enough to reach the casualty department receive such thorough treatment that the incidence of tetanus there must be very low, but minor lesions are a different matter. The horny hands of the professional gardener are unlikely to be infected by trivial injury such as punctures from thorns, but the week-end gardener has a readily vulnerable epidermis, and should his wound become septic or show necrosis tetanus becomes a very real danger. The perils of manured soil should be as well known to the gardening public as to the doctor, and though it is too much to expect the amateur gardener to rush to the doctor with every lesion, he should know of the special risk from penetrating wounds, and the advantage of antiseptic treatment of those that are more superficial.

LONDON HOSPITALS IN WAR-TIME

ON June 30 a letter appeared in the press signed by twelve chairmen and treasurers of London teaching hospitals, who complained that lack of a director, charged with full responsibility for the war-time organisation of the London hospitals, has meant that there is at the moment nothing more than an outline scheme on paper. The work of the sectors, it is widely felt, is not sufficiently coördinated, and many decisions of policy remain outstanding. Mr. Walter Elliot, the Minister of Health, on July 13 informed representatives of the hospitals of the Ministry's plan for ensuring coöperation between the medical group officers and the lay sector officers. Dr. J. H. Hebb, director-general of emergency medical services at the Ministry, will meet the medical group officers every Monday, Mr. Neville, the principal assistant secretary in the Ministry responsible for the administrative side of the scheme will meet the lay sector officers every Tuesday, and Sir Girling Ball chairman of the medical group officers, and Sir George Cory, chairman of the lay sector officers will meet Sir George Chrystal, permanent secretary of the Ministry, every Wednesday. At this last meeting Sir Frederick Menzies medical officer of the L.C.C., and Sir Bernard Docker, representative of the London voluntary hospitals, will be present, also Dr. Hebb and Mr. Neville. Immediately after it Sir George Chrystal will report to the Minister on matters of policy, and thus the Minister will himself deal direct with London's special problems. While expressing the view that these arrangements would go a long way towards meeting the immediate situation and should be given a trial, the hospital representatives feared that Mr. Elliot might find it impossible, owing to his other burdens to continue to play the personal part he had indicated.

THE UNNATURAL ATHLETE

ATTEMPTS to introduce more vitality into professional football have become so widespread that the British Medical Association has decided to inquire next autumn into the alleged benefits of using endocrine extracts for this purpose. Hitherto, as Boje remarks,[1] there has been little serious research on the adventitious aids to athletic success. His own paper on the subject ranges over a wide field from cocaine to hormones and from glucose to vitamins. A rough-and-ready classification puts the preparations capable of "doping" athletes in three main categories according to the risk involved. Thus cocaine, Benzedrine (amphetamine), nitroglycerin, digitalis, strophanthin, certain hormones and caffeine in large doses are in Böje's opinion definitely dangerous. At the other end of the scale, ranking as quite harmless, are glucose, oxygen and vitamin B_1. In an intermediate category he would put the cardiac stimulants, Coramine and Cardiazol, ultraviolet irradiation, various salts and small doses of alcohol. Boje admits that there are certain substances which, when given with the skill which comes from a working knowledge of pharmacology, are capable of enhancing athletic activities and achievements. But when he singles out one drug after another for detailed discussion, there is more often that not some catch or "but" which robs the reader of any whole-hearted faith. From the standpoint of sport, this is perhaps all to the good.

MR. E. L. SHERIDAN, F.R.C.S.I., has been nominated, by the Privy Council, chairman of the Dental Board of the United Kingdom in succession to the late Sir Francis Acland. Mr. Sheridan, who is professor of dental surgery in the National University of Ireland, was an original member of the board and has for the past ten years represented qualified dentists practising in Ireland. He is one of the additional members of the General Medical Council appointed by the Privy Council under the Dentists Act, 1921.

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1 Böje, O., *Nord. Med.* June 30, 1939, p. 1963.

NURSING COURSES FOR SCHOOL-GIRLS.—*Last year* the General Nursing Council passed a resolution (*Lancet*, 1938, 1, 807) approving the division of the preliminary state examination into two parts, the first of which might be taken before entering hospital provided that the candidate had followed an approved course of instruction at school. The Board of Education has now issued a circular (No. 1471) explaining the arrangements which they have made in coöperation with the council for courses in anatomy, physiology and hygiene to be given in secondary schools and technical schools for girls who wish to enter the nursing profession. In view of the serious shortage of nurses the board hope that many schools will find it possible to establish pre-nursing courses which they can recommend to the council for approval. *In a report published* some months ago the Interdepartmental Committee on Nursing Services pointed out that the number of probationers required annually was 12,000. This figure is much in excess of the possible supply of entrants from secondary schools. The circular therefore, follows the report in recommending that in addition to courses in secondary schools there should be evening courses in technical schools which can be taken by girls and young women already in employment. There may also be whole-time day courses in technical schools for girls and young women who have left school and are not employed or can afford to leave their employment.

SPECIAL ARTICLES

VENEREAL DISEASE

THE ninth Imperial Social Hygiene Congress met in London last week and on Thursday held discussions of immediate medical importance.

THE SITUATION AND THE REMEDIES

Colonel L. W. HARRISON, presenting a Review of the Position in Respect of Syphilis and Gonorrhœa, said that the number of cases of syphilis (in all stages) dealt with for the first time at the centres in England and Wales (including transfers and those that returned after being struck off the books in previous years) had fallen from 42,800 in 1920 to the provisional figure of 18,034 in 1938, and the number of infections of less than a year's duration (5238 in 1938) had fallen by 42 per cent. since 1931. On the assumption that 40 per cent. of the 42,800 cases dealt with in 1920 were fresh infections (some observers put the figure at 66 per cent.) the decline in fresh cases from 1920 to 1938 could justifiably be taken as about 70 per cent. The infantile mortality from syphilis had risen from 1·34 per 1000 live births in 1912 to the peak figure of 2·03 in 1917; but thereafter, apart from one setback, it had declined steadily to 1·12 in 1922, 0·47 in 1932 and 0·20 (provisional) in 1938. The latter figure represented one-sixth the number in 1912 and one-tenth that in 1917. Further evidence of the decline of syphilis was provided by the results of routine tests in pregnancy: in Battersea the percentage of positive tests fell from 3·5 in 1924 to 0·7 in 1936, in Cardiff the figure declined from 3·1 in 1925–28 to 1·8 in 1935, and in Glasgow the figures were 4·9 and 1·8 in 1925 and 1935 respectively. Between 1931 and 1938 the number of cases of congenital syphilis seen for the first time in treatment centres (excluding transfers and cases registered in any previous year) had declined in all age-groups under fifteen years (in 1938 in the age-group 5–15 years the provisional number of cases, 448, represented a 39 per cent. decline); but over fifteen years, as was to be expected, there was no decrease.

There was thus, said Colonel Harrison, a substantial decline in the incidence of fresh syphilis in England and Wales in spite of defaulting; but could we look forward to a reduction in the incidence of late effects or would a large proportion of defaulters die? He thought that the evidence was against this fear. Firstly, correlating late cases and the amount of treatment received, it was found that in one series of 936 cases (809 with cardiovascular or neural syphilis), of 931 whose history was known, only 8 had had more than an average course of ten injections in the early stages. Secondly, despite the increase of syphilis in England during the late war (87,000 of the total of 102,000, excluding the Navy and demobilisation figures, were estimated to be fresh cases), though the crude annual death-rate from aneurysm per million living had risen in females from 11 per million living in 1922 to the provisional number of 26 in 1938 (the figures for males rose from 45 to 52 in the same period), the corresponding figures for tabes were actually reduced from 7 to 5 in females and from 36 to 24 in males, and for G.P.I. the figures declined in females from 15 to 10 and in males from 77 to 32. Therefore even slight treatment—approximating to one modern course—seemed to have prevented a great amount of aneurysm developing. Nevertheless it was necessary to redouble efforts to get women under treatment in order to reduce the incidence of fresh syphilis and the late effects in future years. Colonel Harrison uttered a warning against blind acceptance of the first positive Wassermann reaction in pregnant women, even when backed by a positive Kahn; although routine testing was valuable in the prevention of congenital syphilis it might be harmful if used as more than a pointer. Secondly, since it appeared that, unlike bismuth, the arsphenamines and mercury failed to reach the fœtus in effective amounts until the latter part of pregnancy, the practice of intensifying arsenical treatment, while excluding bismuth, was probably without effect.

The position as regards gonorrhœa had been favourably affected by the introduction of sulphonamide therapy. But dangers attended failure to use the drugs in optimum concentration, and often practitioners instructed the patient to treat himself, *with unhappy results*. *Action against present ignorance* might take the form of notices sent out by V.D. officers and medical officers, and the British Medical Association might arrange local discussions.

Dr. R. C. L. BATCHELOR (Edinburgh) said that under the Edinburgh venereal-diseases scheme reproduction is advocated both indirectly—for example, by providing attractive premises for the expectant mother—and directly by optimism about the prospect of cure, which was justifiable perhaps with the present remedies for syphilis and gonorrhœa. He thought a hospital-trained sister with special knowledge and experience in venereal diseases was more likely to be successful in social-service work than a male almoner. There was less need of hostels for women and girls now that chemotherapy cleared up infections rapidly, and adequate medical supervision was ensured by admitting girls to hospital for inpatient treatment during the early infectious stages of the disease; furthermore, the struggle for a livelihood could be resumed earlier. Turning to the advisability of continuing routine Wassermann tests in expectant mothers, Dr. Batchelor pointed out that the results of 15,763 blood examinations at the Royal Maternity Hospital and the Elsie Inglis Memorial Maternity Hospital between Nov. 1, 1934, and Oct. 31, 1938, showed the percentage of positive cases to be 0·7 and 3·3 respectively. Although the incidence of syphilis was small, its detection could be of great preventive value to the whole family; its omission would therefore be a retrograde step, especially as in a time of national emergency there would be an increased incidence of syphilis. Dr. Batchelor concluded that a venereologist should concern himself both with the patient and the social implications of his particular case: we were still too easily acquiescent in the degrading and depressing influences that led to venereal disease.

Dr. A. O. FERGUSSON ROSS (Liverpool) suggested instruction in the use of the sulphonamide drugs through postgraduate classes for panel practitioners.

Lieut.-Colonel E. T. BURKE (London) emphasised the necessity of looking into the history and of testing the cerebrospinal fluid, as well as the blood, to detect syphilis in females. The routine test in pregnancy was in his view invaluable, but the possibility of a "false" negative in women who were undoubtedly syphilitic should not be overlooked. In chemotherapy hæmatological examinations were necessary to avoid overdose; but it was equally important to

guard against carriers and relapses due to inadequate dosage, also the test of cure should be more stringent He emphasised that the Wassermann testing of voluntary blood donors was essential, but was not being done

Dr ROBERT FORGAN (Essex) considered that advice regarding chemotherapy would be best offered by medical officers of the Ministry rather than venereal-diseases officers He believed that improved results could be got from a measure of compulsion in treatment

Dr LETITIA FAIRFIELD (London) said that among over 13,000 pregnant women attending London County Council clinics during 1935 the percentage of positive Wassermann and Kahn reactions was only 0 83 (excluding "suspicious" cases), and a similar low figure was obtained in 1936 In 1935 98 per cent of all positive women, 97 2 per cent of those who had four injections or more of arsphenamine, 95 per cent of those who had less than four injections, and 95 per cent of those who had none, went to term Although to these 13 000 women only 3 children as yet known to be syphilitic were born, it was impossible before the lapse of thirty years to prove that the remainder of the children whose mothers gave positive tests were safe Dr Fairfield urged the importance of following up the parents in cases of ophthalmia neonatorum

Dr A MIDDLETON HEWAT (London) contended that there is no agreement among clinicians about the details of chemotherapy and suggested that practitioners should send their patients to clinics for a satisfactory test of cure He favoured separate clinics for cases with vaginal discharge, and said that although he had found no change in hostel attendances among pregnant girls chemotherapy had resulted in a falling off of attendances of nulliparous girls In his experience girls would not go into a hospital bed

Colonel HARRISON said that tissue resistance probably played a part in the lower incidence of syphilis in women The disease was less damaging to a castrated animal under the influence of œstrin than it was to a normal male animal.

Dr BATCHELOR said that in his experience the female nurse almoner brought back over 90 per cent of defaulters The relapse rate of 1102 cases receiving antisyphilitic treatment at the Edinburgh clinic was 0 9 per cent in males (average of 3 6 unit courses) and 3 7 per cent in females (average of 3 unit courses) Of 413 notifications of ophthalmia only 5 per cent proved to be gonococcal Referring to blood donors he recalled that McClusky of Glasgow had reported 2 cases of donors who were incubating syphilis and developed it later, a Wassermann reaction was advisable two months before giving blood, the patient being put on parole in the interim

Mrs C NEVILLE ROLFE, secretary general of the British Social Hygiene Council, in seconding a vote of thanks to the chairman, Sir ARTHUR MACNALTY, remarked that whereas congenital syphilis had decreased as a whole, the problem had not been tackled in such areas as Cornwall and Devonshire

ASCERTAINMENT

At the second discussion, with Prof JAMES YOUNG in the chair, Dr ERNEST PRITCHARD (Liverpool) spoke on the ascertainment of venereal disease in a community Any census, he said must include clinic and hospital cases (the latter being chiefly late ones), cases treated by specialists and general practitioners, and self treated cases, the latter group, owing to the 1917 act, would not present such a problem as it had in the United States Self treatment, however, had increased here since the advent of sulphonamide therapy, and the sale of all drugs of this group should be restricted Methods of assessing the incidence of venereal disease in the U S A included the sending of a questionnaire relating to the number of cases under treatment or observation on a given day, together with a numbered confidential inquiry form, to every person concerned with the treatment of these diseases, the inquiry was repeated if necessary The tabulated figures obtained gave what was called the treatment "prevalence" rate, this in the U S A was 7 7 (syphilis 4 3, gonorrhœa 3 4) per 1000 of population, corresponding to totals of 683,000 and 493,000 cases under observation or treatment for syphilis and gonorrhœa respectively, it was lower in cities of over 100,000 population than in smaller cities The annual incidence of fresh infections with syphilis and gonorrhœa was respectively 4 and 8 per 1000, 71 per cent of patients with syphilis and 51 per cent of cases of gonorrhœa sought treatment in the late stages A second measure was the monthly census From 1929 onwards questionnaires had included the number of cases accepted during one specified month The total number of early cases so obtained, multiplied by twelve, gave the "incidence" of syphilis, often stated as "518,000 fresh infections from syphilis never before treated come to doctors each year" Mass blood testing of different occupational or other groups was also undertaken In the U S A some 2 or 3 million people had been tested, from which the average prevalence of syphilis in the general population was deduced as around 5 per cent, although great variation occurred in different groups, being highest in the coloured race Whereas in 1935 in the U S A the percentage of early cases seeking treatment was estimated at 43 and 57 for syphilis and gonorrhœa respectively, the corresponding figures in Liverpool in the same year were 13 8 and 86 2, syphilis was apparently more prevalent in the U S A, or perhaps cases of gonorrhœa escaped the census

The procedure in Canada followed in general the lines of the American questionnaire and the 1937 census in Toronto was completed in six weeks, 97 3 per cent of the recipients sending in a reply A summary of the results indicated a total incidence of venereal disease of 9 59 (syphilis 5 64, gonorrhœa 3 95) per thousand population The sex incidence of syphilis was 57 per cent males and 43 per cent females Compared with the surveys in 1929 and 1931 early cases of syphilis had decreased by half and late cases had increased by more than half

In the discussion it was maintained that a census is desirable in Great Britain

Mrs NEVILLE ROLFE pointed out that the relative incidence of gonorrhœa and syphilis in the United States Army and Navy is about 8-9 to 1—that is to say, the figures were comparable with those for this country

Dr S M LAIRD (Stoke on Trent) described observations in various parts of Staffordshire in 1937, which showed a percentage of defaulters in early syphilis in the region of 50 per cent, irrespective of age groups, the figure for gonorrhœa being about 30 per cent Contacts outnumbered those treated

Colonel HARRISON considered it hopeless to define the defaulter rate since the standards of complete test of cure and treatment were very variable.

MEDICINE AND THE LAW

Amputation of Leg after Childbirth

THE House of Lords decision in Marshall *v* Lindsey county council in 1937 probably represented the high-water mark of a plaintiff's success against a doctor or a hospital in the matter of puerperal fever Last week the Lord Chief Justice dismissed a much weaker claim in Mitchell *v* Outred and others, without the defendants being called upon to make their reply Mrs Mitchell went into the Crayford (Kent) Russell Stoneham memorial hospital in 1937 for her first confinement Dr T. C. Outred of Northfleet attended her On May 1 a healthy child was born; the child is still doing well According to Mrs Mitchell's counsel, her temperature rose after the childbirth, on May 21, at the wish of her husband, she was removed to her own home; a few days later she complained of a pain in the right thigh which Dr. Outred attributed to neuritis On June 4 Dr. Outred discontinued his attendances as he was going to a practice several miles away. His former partner, Dr. W A. Rogerson, took charge of the patient. Her temperature rose to 104° F; a second opinion was taken; puerperal fever was diagnosed, the patient was admitted to the Miller General Hospital at Greenwich where her leg was amputated on June 24 Mrs Mitchell now claimed damages on the ground of negligence from Dr Outred, the matron of the Crayford hospital, and the president, chairman, general secretary and treasurer of the hospital It will be remembered that in the Marshall case the Lindsey county council provided a maternity home and placed it under the direction of a skilled staff A patient in the home contracted puerperal pyrexia A second patient applied for admission and was admitted without being told of the existing infection The second patient contracted puerperal sepsis and the House of Lords held that the county council was liable Mrs. Mitchell's case was much less definite She alleged that, owing to the negligence with which she was treated by the doctor and the hospital, she developed septicæmia consequent on puerperal fever with the result that her right leg was amputated At the close of her case the Lord Chief Justice ruled that there was no evidence to go to the jury against any of the defendants It had been established that on June 24 it was unhappily necessary to amputate her leg, but there was no evidence to connect the amputation with any negligence or breach of duty on the part of any of the parties whom she was suing. Judgment was therefore given for the defendants with costs Rejecting an application for a stay of execution, Lord Hewart expressed the opinion that the action was entirely misconceived

The experienced counsel who represented Mrs Mitchell could hardly take up the position that the existence of puerperal fever was in itself a proof of professional negligence and a proper ground for the award of damages to a patient. In so far as the particulars of negligence on which the claim was based are to be found in his opening address to the jury, it may be noted that he dwelt on the fact that Dr Outred took no second opinion and made no blood-tests Counsel drew attention to the duty to report the high temperature to the medical officer of health. He described certain entries in the temperature book as danger signals which should have warned the doctor and the nurses of the need of great care The actual temperature chart at the hospital had been destroyed two years ago; counsel said it was obvious that the temperature chart was not kept in the usual way Puerperal fever, he said with full truth, is usually caused by infection from outside, doctors and nurses therefore wear sterilised masks, gloves and clothing while attending a patient and the treatment must be completely antiseptic These precautions were not taken at Mrs Mitchell's confinement (there was evidence subsequently that Dr Outred wore gloves and a rubber apron but not a mask or gown); their absence might well have caused her infection. Counsel observed that Dr Outred administered Prontosil to Mrs Mitchell while she was in the hospital and that apparently this step had the effect of reducing the temperature; afterwards he used the drug intermittently, "in so doing he obscured the signs of puerperal fever which would have warned him if he had seen them" Other complaints, challenged in cross-examination of the plaintiff, were that the hospital was understaffed and that the patient was asked not to ring her bell at night. In concluding his statement to the jury, counsel announced that doctors of eminence would say that the history of the case immediately suggested to them that Mrs Mitchell had suffered from puerperal fever, they could not suggest anything else which would result in the amputation of her leg

The expert witnesses to whom this announcement referred suffered from the disadvantage that their evidence was a matter of surmise at a time long distant from the material events in the case. Dr J. D S Flew, physician to the antenatal department of Queen Charlotte's Hospital, expressed the view that, from the account of the patient's symptoms which he had heard, she must have been suffering from septicæmia when she returned to her home, and that the loss of the leg must have been due to puerperal fever. "How often did you see Mrs Mitchell when she was ill?" inquired the Lord Chief Justice "Never," replied the witness Dr Flew emphasised the importance of the wearing of masks in the labour room and the use of masks and sterile gloves by nurses for the first week after the birth of the child. He was asked in cross-examination whether at Queen Charlotte's there had not been about 5 per cent of cases of puerperal fever among patients in 1937 in spite of every precaution against infection He said he thought the figure sounded rather high Does this not show, he was asked, that, do what you may, you cannot escape the possibility of puerperal fever? The witness agreed. "The occurrence of puerperal fever," continued counsel for the defendants, "does not prove that there has been any fault anywhere?" "I did not say it did," he replied He agreed that many practitioners did not use masks or gowns during a confinement and that the regulations for midwives issued in 1939 do not prescribe that a midwife should wear a mask or gown or gloves at a confinement Dr R. M Fry, assistant director of the research laboratories at Queen Charlotte's, repeated and confirmed previous evidence as to the advisability of gloves, gowns and masks and the need of watching carefully every temperature in the post natal period The loss of Mrs Mitchell's leg, he said, might be due to the thrombus which originated the embolism in the lung, giving rise to a cough from which witnesses had said that she suffered, but the case was an unusual one, he had never seen such a case before "Are you aware," asked Lord Hewart, "of the facts immediately preceding the amputation?" The witness answered in the negative A third expert witness, Mr. Norman White, assistant obstetric surgeon to University College Hospital, gave similar evidence of the need of precautions against

infection and of further investigation when a patient's temperature rose He was asked in cross examination whether the man in charge of the case on the spot, assisted by competent nurses, was not in the best position to judge the proper course The evidence of this witness concluded the plaintiff's case, and, after argument by counsel, the Lord Chief Justice dismissed the action as already stated

Rejuvenation Fraud

If Mrs Mitchell's case failed because she proved effect but not cause and because the claim remained a matter of surmise a plaintiff who had suffered from treatment at a "rejuvenation health clinic" and who had received attention from two "doctors," whose names are apparently not to be found in the Medical Register, won an easy victory in an adjacent court on the same day (Shallard v Arlme and Gustavson) One of the defendants Miss Arlme, carried on the clinic at 14, Herbert Crescent, Knightsbridge, the other, Carl Gustavson, administered the treatment Mrs Shallard based her claim not only upon negligence and breach of contract but also upon fraud The judge found that the two defendants divided the proceeds of a fraudulent scheme for extracting money from a middle aged woman in indifferent health He hoped that other women would profit by the lesson of the plaintiff's disagreeable experience

Mrs Shallard's evidence was that, after nursing her husband for several months until his death at the end of 1937, she was persuaded by Miss Arlme to try the Gustavson treatment at the clinic She was given a pamphlet about his facial and other rejuvenation treatment which was described as absolutely harmless and certain in its efficacy She met Gustavson, who said that he would make her fit and well but that he had never treated anyone who had not first been examined by a Dr Macnab She paid two guineas for this examination and was told by Gustavson that "Dr" Macnab (whom her counsel declared not be a doctor at all) had reported that her condition was good except for the toxins in her body These toxins the Gustavson treatment would remove His fee would be 200 guineas On March 14, 1938, Mrs Shallard entered the clinic She was put to bed and some substance was applied to her face which burned her She was given tablets which made her vomit Next day there was similar treatment Her eyes became painful She was placed in a bath of Epsom salts On March 18 bandages were taken off which tore the skin from her forehead and neck, leaving them sore and bleeding She was in pain until March 28 when she insisted on being driven home Her condition improved by July, in August she had a nervous breakdown, and from September until the spring of this year she was in bad health Two medical practitioners who saw her in October gave evidence of her condition at that date One of them, a dermatologist, said that her face and eyelids were swollen there was some conjunctivitis her skin was thickened and had a mask-like appearance she complained of burning and irritation Her condition he said, was consistent with the experiences of which she complained. The other doctor spoke of having observed acute symptoms of heart failure for which he injected strychnine Asked by the judge how the heart failure could have resulted from the facial treatment, the witness said one cause of it might be worry and fright at the thought of possible blindness and disfigurement

Miss Arlme's defence was a denial that she and Gustavson were partners, though she said that, believing his treatment to be thoroughly satisfactory, she placed rooms in her clinic at his disposal for a consideration of one third of his fees She maintained that, if she had brought Mrs Shallard and Gustavson together, she had done so in good faith, she believed the statements in his brochures, she had not been present at the patient's actual treatment and was not responsible for its results Gustavson did not come into court The judge remarked that he had left Miss Arlme to defend the case alone in a way which belied the manly appearance presented by him in the illustrations to his brochure. Plaintiff's counsel stated that Gustavson, a Swede, had left the country, the Home Office apparently would not allow him to remain At any rate efforts to serve him with a writ were unsuccessful The judge said there was no evidence before him to show whether, at the time when Mrs Shallard received treatment, the clinic in Knightsbridge was licensed by the London County Council, if it was licensed, it was unfortunate that no L C C inspector knew what was going on

Agranulocytosis following Chemotherapy

An inquest was held in Manchester on July 15 on a woman of 36 who died in Manchester Royal Infirmary on the 11th She had been admitted to the Devonshire Hospital, Buxton, on May 26 with rheumatism, she also had chronic catarrh and heart trouble Treatment of the rheumatism progressed favourably, but she developed erysipelas This was treated with sulphanilamide, of which she had 1 5 grammes daily for 16½ days Then the treatment stopped, but it was started again five days later, when she had the same dose for 3½ days On July 7 she complained of a dry throat and a slight swelling of the tonsils was noticed Next day the swelling had increased and on the 9th the patient was transferred to Manchester Mr W F Nicholson, resident surgical officer, said that she was then very ill and it was found that the white cell count was much diminished and that the polymorphonuclear leucocytes amounted to only 2 per cent The diagnosis of agranulocytosis was supported by the results of post mortem examination In answer to the coroner Mr Nicholson said that in reported cases to which he had referred the patients had all taken considerably larger doses of sulphanilamide than were given in the present case He added that the condition was exceedingly rare In recording a verdict of death from misadventure, the coroner said he was satisfied that proper treatment had been given at the Buxton hospital and that the woman was one of the small number of people upon whom the particular remedy had a bad effect

THE LANCET 100 YEARS AGO

July 20, 1839, *p* 638

Questions set in the London M B examination

SURGERY

1 Define common acute inflammation, its characteristic symptoms and causes

2 State the various terminations of inflammation, with the treatment of each respectively

3 How do you class wounds arising from external violence? Describe their nature symptoms, and treatment

4 What is the process by which union is accomplished in a simple fracture of a cylindrical bone?

5 Give the different dislocations of the shoulder joint, their symptoms and mode of reduction

6 What is hydrocele—its palliative and radical treatment?

7 Enumerate the different situations and names of hernia with the various conditions in which they may be found

8 Describe the operation for popliteal aneurysm

MEDICAMENTS AND PUBLIC HEALTH

THE British Pharmaceutical Conference was held at Birmingham from July 17 to 20. In his address from the chair, Mr. J. RUTHERFORD HILL said that he was attracted to the subject of medicaments and public health by two events. The first was a monograph by Prof. A. J. Clark dealing with the harm done by proprietary medicines in the production of addiction, accidental poisoning, dangers associated with self-medication, misinformation of the public and financial loss. The problem was summarised in section 22 of the Report of the Select Committee on Proprietary Medicines of 1914 in the words: "For all practical purposes British law is powerless to prevent any person from procuring any drug, or making any mixture, whether potent or without any therapeutic activity whatever (as long as it does not contain a scheduled poison), advertising it in any decent terms as a cure for any disease or ailment, recommending it by bogus testimonials and the invented opinions and facsimile signatures of fictitious physicians, and selling it under any name he chooses, on the payment of a small stamp duty, for any price he can persuade a credulous public to pay." The Select Committee found that the trade in secret remedies constituted a grave and widespread public evil, that the existing law was chaotic and had proved inoperative and that consequently the traffic in secret remedies was practically uncontrolled. The Committee concluded by saying "That this is an intolerable state of things and that new legislation to deal with it, rather than merely the amendment of existing laws, is urgently needed in the public interest." So far the only amendment of that unsatisfactory position is the Venereal Diseases Act (1917), which forbids treatment of these diseases otherwise than by duly qualified medical practitioners and expressly forbids the advertisement or sale of any remedies purporting to cure these diseases.

Prof. Clark concluded his monograph by saying: "The health interests involved in the sale of medicines are vastly more important than the million pounds which the Government obtains from the taxation of proprietary remedies. The clearest line for the Government to take would be to say that it did not wish to tax any remedy that was beneficial to the health of the people and wished to suppress all those that were useless and harmful. This would imply the abolition of the Medicine Stamp Duty." The second event was the debate in the House of Lords in July last year, when Lord Horder moved for papers in view of the enormous growth in the quack medicine trade and the incongruity of exercising no control over the deleterious effects of such trade upon health at a time when serious effort is being made to improve national fitness. He rightly describes the advertisements of many of these "proprietary medicines" as "grossly misleading and fraudulent." He pointed out that in continental countries, and in the United States of America, exploitation of the people by means of proprietary medicines was forbidden, while in our own Dominions of Australia and Canada offenders were liable to heavy penalties for making false or fraudulent claims. It was humiliating to think that Great Britain remained complacent in face of this growing menace to the health of her people.

The problem has at the moment been brought prominently to the front by the recent intimation by the Chancellor of the Exchequer that he had decided to abolish the Medicine Stamp Duties in this year's Budget. In a recent High Court case the judge described the Medicine Stamp Acts and relative regulations as a mass of confused and obsolete verbiage that should be swept away. The Chancellor seems to have accepted this view and remains of the same opinion. That has long been my opinion, and it is an opinion widely held among pharmacists who have had experience of the Acts. In reality medicines required by sick people are not a proper subject for taxation. The Medicine Stamp Act is perhaps the only remaining example of an unsatisfactory kind of legislation in the time of George III, when the British Exchequer was seriously impoverished by the Napoleonic Wars and the American War of Independence. All other petty, vexatious and restrictive taxes were abolished under the fiscal reforms of W. E. Gladstone; but the Medicine Stamp Act, being a small affair, has been allowed to remain. It is an anachronism and should be abolished. But it has, however, operated as a restraining influence, through its ad valorem stamp duty and the reservation of the right of pharmacists to sell known and approved remedies; to abolish suddenly all restraints might be prejudicial to the public-health interests of the community, and widen the gap alluded to by Lord Horder. By a piece of skilful parliamentary tactics the council of the society and the allied interests are to be congratulated on persuading the Chancellor to continue the Medicine Stamp Duties for another year, but it will be well to keep in view the total abolition of Medicine Stamp Duty when the public-health aspect has been adequately secured. I now come to my constructive proposals.

THE RECOGNITION OF MEDICAMENTS

There is need for some central authority to recognise proper and reliable medicaments. A combination of the British Pharmacopœia and the United States Pharmacopœia might be the first stage in securing a Universal Pharmacopœia, and Dr. C. H. Hampshire has been called upon to frame such a world pharmacopœia. But this does not solve the whole difficulty in settling what are proper and reliable medicaments. New drugs and methods of treatment are constantly being introduced. It is necessary, therefore, to have some standing authority with power to act and make recognitions and regulations as occasion arises. I have in mind some such body as the Council on Pharmacy and Chemistry of the American Medical Association which publishes an approved list of new and non-official remedies, the purpose of which is to protect the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connexion with proprietary medicinal articles. To be effective any such representative body would need to have parliamentary sanction.

THE DEFINITION AND CONTROLLED SUPPLY OF MEDICAMENTS

The welter of names and the puzzling and confused nomenclature of medicaments calls loudly for some simplification and clarification. Some action seems necessary so that we should not have the same definite chemical substances put on the market by several manufacturers under different proprietary names. There should be some limit also to the putting up of mixtures of known substances under a proprietary name, so that the pharmacy shelves shall not be loaded with several proprietary preparations which are really combinations of well-known medicaments.

In a well-regulated state effective arrangements should be made for some reasonable control in the

supply of medicaments Such control must be solely in the public interest and never for the benefit of a particular class The principle is already in operation on a limited scale About 90 years ago there was widespread public alarm at the numerous cases of poisoning by arsenic which was sold indiscriminately by anyone The Arsenic Act of 1851 was passed by which it was attempted to secure public safety by imposing regulations About 10 years later public alarm was again created by a series of poisoning cases After a prolonged inquiry Parliament was persuaded that mere regulation was ineffective, and that the real protection of the public could only be secured by providing that poisonous substances should only be distributed to the public by the hands of a duly qualified pharmacist This principle that the safety of the public is secured by limiting the distribution of such substances to properly trained and qualified persons is the basis of the Pharmacy Act, 1868 This principle is confirmed and extended under the Pharmacy and Poisons Act, 1933

A WIDER APPLICATION OF PUBLIC CONTROL

I suggest that there is a strong case for a much wider application of such public control It would be in the interest of the community as a whole that the dispensing and distribution of all medicaments should be entrusted by the state to those persons who have complied with the statutory requirements as dispensers The mere fact that an article can only be obtained from a properly qualified person suggests to the purchaser caution in the use of the article, and the pharmacist would naturally, as he does in the case of powerful drugs, give any necessary guidance or information The qualified pharmacist, though he knows little or nothing of pathology and would not presume to diagnose or prescribe, knows enough about the evidences of illnesses to be able to warn a purchaser in cases where the article he wants to purchase is distinctly contra indicated The matter is one requiring most thorough investigation and it is suggested that the Government should be approached by joint representatives from the medical and pharmaceutical professions requesting the appointment of a Royal Commission to investigate and report as a basis for legislation

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE ATTACK ON CANCER

THE Department of Health for Scotland has issued a circular on the application of the Cancer Act, 1939, to Scotland As is now well known, the act places on local authorities the obligation to make suitable arrangements for the treatment of persons who are suffering from the disease The arrangements proposed are to be submitted to the department by the end of next March, and before submitting them the authorities must consult with the governing bodies and medical and surgical staffs of voluntary hospitals providing services for the benefit of their areas and with representatives of the local practitioners To avoid unnecessary expense and overlapping it is recommended that arrangements should be made for regional schemes In this way the less populous districts, particularly in the Highlands, will be able to obtain satisfactory services that they might not otherwise be able to afford No very large provision of new hospital beds by councils is anticipated by the department, particularly in those areas which are already served by large voluntary hospitals Here it is thought that local authorities will wish to coöperate with the voluntary hospitals in helping to develop existing facilities, by contributions towards the capital cost, both in accommodation and equipment In addition, payments will be made for the maintenance and treatment of patients Further, councils are to include in their schemes arrangements for follow-up, supervision of patients between visits to treatment centres, record keeping and the travelling expenses of patients However, they are to recover from patients such proportion of the cost as can reasonably be afforded

By instruction of the public it is hoped to convince cancer sufferers that early treatment holds considerable chance of cure and to overcome the dread that so often leads to dangerous delay

REVASCULARISATION OF THE HEART

In a lecture lately given in Edinburgh Mr L F O'Shaughnessy, of London, said he was satisfied that artificial adhesion between the omentum and the heart is compatible with normal function, and that the heart can be vascularised through the junction He employs omental grafting in preference to the pectoral muscle method of Beck, and he supplements the graft by the application of aleuronat paste to promote the formation of adhesions In a few instances he has carried out cardiopneumonopexy as an alternative

Surgical treatment of patients suffering from cardiac ischæmia should, in Mr O'Shaughnessy's opinion, be undertaken only when the outlook under medical treatment is uncertain A suitable patient might, for example, be a man in middle life who has had one attack of coronary thrombosis and has made a poor natural recovery If pain and cardiac dysfunction still remain six months after the accident, vascularising operations may be employed to supplement natural recovery Patients with disease round the coronary orifices but healthy coronary trees are suitable for operation both theoretically and practically In the case of angina pectoris of effort, in which the degree of coronary artery disease may be hard to estimate, the uncertain prognosis without grafting must be balanced against the risk of the operation, and the patient must make the final decision It is probably undesirable to operate on patients over 65 years of age or on those with gross renal or cerebral arteriosclerosis Moderate respiratory affection is not a contra indication, since with modern anæsthetic methods and with the new and simpler extrapleural approach to the pericardium postoperative respiratory complications are uncommon

Mr O Shaughnessy gave details of some of his failures as well as some of his successes In one series of 20 cases of cardiac revascularisation 15 patients had angina Of these, 5 died on the table, 1 died from uræmia three months later, and 1 died from heart failure two months after operation Of the survivors bedridden patients were able to become active and some were able to return to work. This ability to return to a normal life is to be considered the criterion of success

THE LATE PROF JOLLY

Scottish medical men will have learnt with regret of the death in Cape Town of Dr W A Jolly, professor of physiology in that university Prof Jolly was an Edinburgh man and an Edinburgh graduate, and he worked in the physiology department in

Edinburgh before going to Cape Town in 1911. Among his many contributions to physiological knowledge will be recalled especially those concerned with electrophysiology, internal secretions, and cerebral function. In collaboration with W T Ritchie he published the first electrocardiograms of human auricular flutter, and gave the name to the condition. His alma mater conferred on him the honorary degree of LL D in 1926.

VIENNA

(FROM OUR OWN CORRESPONDENT)

MORE NON-ARYAN PRACTITIONERS TO PRACTISE

As was mentioned some months ago (*Lancet*, Nov 19, 1938, p 1191) most persons of Jewish nationality practising in the Austrian countries have lost their right to practise, except a limited number required for the remaining Jewish population. Lately however it has been found necessary to admit another batch of practitioners of this kind, since most of those admitted in October, 1938, have been forced to emigrate Now again we are informed that a number of former general practitioners have been allowed to renew their professional activities. They are mostly men well above 60 years of age, for nearly all the younger ones are now out of the country trying to find a living somehow somewhere. While last year only those doctors who had seen active service in the world war were eligible for consideration, now hardly any differentiation is taking place. Even a number of female practitioners, including younger ones, have been allowed to practise. In the only Jewish hospital there is a constant fluctuation among the chiefs of departments Nearly all the prominent men, also numerous trained assistants and nurses, have left the country already, so that those now in office are overworked and the quality is not what it was a year ago. As a result of the constant emigration, the bulk of the Jewish population of Vienna—about 100,000 persons now, 50 per cent of what it used to be—are elderly people aged between 50 and 100 Children and young adults are rarely seen nowadays, and old and ailing paupers are all that is left for the newly admitted doctors to make a living from.

SHORTENING OF THE MEDICAL CURRICULUM

Some time ago the Minister of Education announced that, owing to difficulties of procuring the necessary number of young persons for the various academic professions, the medical curriculum would be altered, beginning with the new summer term of April, 1939. The duration of medical studies is to be shortened by about two years. The practical training of one year, which hitherto had to be taken after completing the curriculum of 11 semesters or 5½ years, will be now compressed into the studies, which will now last only 10 semesters or 5 years. The examinations, which hitherto took one extra term of 6 months, will also be interpolated "into the time taken up for studies, so that the students will gain two full years, in comparison with the requirements in force up till now" The new curriculum requires the student to take up a number of new studies hitherto unnecessary,—e g, "racial knowledge," problems of population, and practical pharmaceutic botany. Furthermore, the student must take part for 6 weeks in agricultural or factory work, study radiological therapy, "natural therapeutics," occupational diseases, child welfare, accident and first-aid surgery, and industrial hygiene. The Minister expresses his expectation that the shortening of the curriculum and the increase in subjects to be studied will "induce the students to concentrate their efforts to reach the desired aim to the advantage of the national welfare" It remains to be seen whether 5 years' study is sufficient to maintain the high standard of the German medical practitioner, as recognised hitherto

THE NEW "WIENER MEDIZINISCHE GESELLSCHAFT"

In the train of the new regime in Austria, the famous old "Gesellschaft der Aerzte" has been dissolved—after having celebrated its centenary in 1937. The greatest medical names of Germany—including a vast number of Jews—were among its members. Now in its stead a new "Wiener medizinische Gesellschaft" has been formed, designed to serve the needs of practitioners as well as scientific research, and only "Aryans" are admitted Sections of this new society will take the place of all the former specialist groups, and among the new sections is one for military medicine. The president is a politician, who is also a doctor—the district governor of Vienna—and prominent representatives of the various specialties may be entrusted with the task of giving their opinion regarding any question of the nation's health A lecture and demonstrations will be given at every meeting of the society. At the opening session the president, and also Professor Hamburger, explained that "the new principles adopted in the politics will also be governing the evolution of medical science in national-socialistic Germany." Freedom from preconception must be done away with, and a renascence of medical science based on national-socialistic ideology must take place.

RESTRICTIONS IN PRESCRIBING NARCOTICS

With the new year 1939, the pharmacopœia of the German Reich was introduced in Austria and with it the regulations about the prescribing of narcotic drugs. Every prescription of these drugs must show, besides the quantity, the name and address in full of the prescriber, the date, a specification of the application and use of the remedy, the full name and address of the patient, and the remark, "prescription entered or registered" The physician must keep a special book, in which he enters a full copy, with date, address and name of patient, of every prescription containing one or any of these narcotic drugs. He must keep a separate book for cocaine and another for morphine, and show it to the controlling officer of health if required. It is very interesting that these regulations do not apply to dionin, codeine and peronine and substitutes for cocaine In parentheses, it should be stated that one narcotic drug must not be prescribed in combination with another narcotic drug, and that a 1 per cent. cocaine solution intended for use elsewhere than on the eye must be mixed with 1 per cent. atropine sulphate solution.

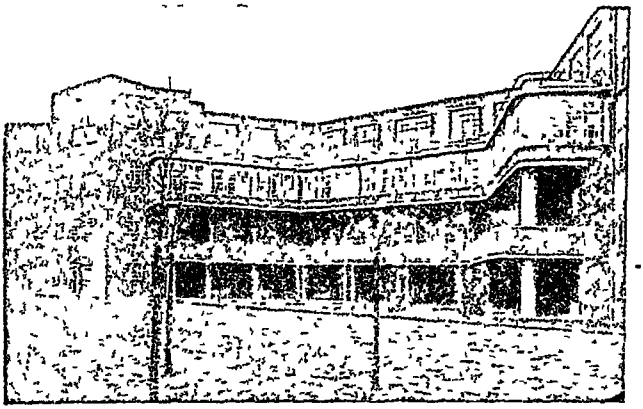
INDEX TO "THE LANCET," VOL I, 1939

THE Index and Title-page to Vol. I, 1939, which was completed with the issue of June 24, is now in preparation A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W C 2 Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

THE MAUDSLEY HOSPITAL

OPENING OF PRIVATE BLOCK AND CHILDREN'S WING

ON July 14 the Earl of Athlone, in opening the new private patients' block and children's department at the Maudsley Hospital Denmark Hill, said that his presence, as Chancellor of the University of London, marked another tie between the University and the London County Council Thirty-one years ago Dr Henry Maudsley gave the Council £30,000 to aid in building a hospital for mental illness, in which early, curable cases were to be treated, exact research was to be promoted and medical teaching in psychiatry was to be provided The present building, which had cost the Council, to date, some £236,000, was the outcome of Dr Maudsley's gift It marked the completion of the last section of a large scheme of structural improvement which has been going on for six years



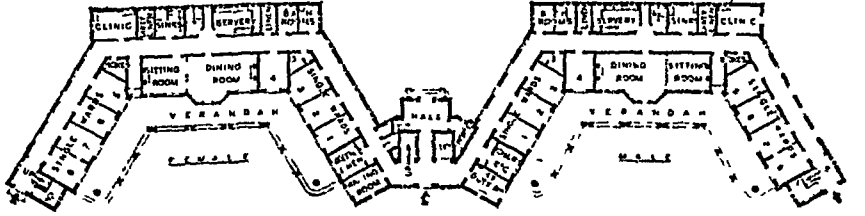
Private patients' block *City General Advertising Service*

DESCRIPTION OF EXTENSION

The small provision originally made at the Maudsley for treatment of private patients in single rooms was some time ago appropriated for other purposes, and the need for adequate private accommodation has become acute The new private block—a building of two wings, fronting De Crespigny Park—is designed to meet the needs of persons who desire treatment, but do not find it congenial in open wards, and are prepared to pay a charge which will cover the cost of separate accommodation and care in single rooms There are three floors, each taking patients of either sex. The structure and organisation are such that very careful classification will be possible, and no patient will have to be treated with others whose illness is of a different and possibly disturbing type No patient will be admitted who does not come in voluntarily Patients will not be received unless the outlook for recovery is good, there is no intention of receiving chronic patients or retaining those whose conduct would be likely to disturb others The new building does not communicate with the original hospital buildings except by a subway and lifts, it encloses one side of an attractive garden, for the use of the private patients, on the other sides are the new children's block, the nurses' home, and buildings which were part of the first extension of the Maudsley, in which are rooms for occupational therapy and physical treatment, an operating theatre, a gymnasium, an entertainment hall, a billiard room, and a library There is an attractive roof garden in the Italian style for those needing greater privacy than the downstairs garden will provide The new building has a wing shaped plan and gives most of the rooms a southern aspect, and there are open verandahs on the ground floor, open balconies on the first floor, and glazed solaria on the second floor

The new children's block has been planned to meet the complete lack of adequate inpatient facilities for child psychiatry in Great Britain, and to provide separate accommodation for an outpatient clinic for children It is intended, not for the backward or mentally defective child, but for the nervous and difficult child who needs individual attention The outpatients' part of the new building is already fully at work, the residential accommodation is not yet occupied Here also the roof space (part of which is enclosed) has been used as an additional playground The block contains, in addition to the wards, consulting and other medical service rooms, a mothers' waiting room, a play room and a room for social workers

In the external treatment of all the new buildings multi coloured facing bricks have been used, to ensure harmony with the existing hospital building The entrances to the buildings have been used as focal points for the design, and, in the children's block, have been adorned with sculpture by Miss Juliana Allan, A R B S, who has also executed the two small figures to be seen in the roof garden The cost of the present and previous extensions has been about £174,000 The main contractor for building work was W H Gaze of Kingston on Thames Mr E P Wheeler, until recently architect to the Council, was responsible for the design



GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A WOMAN PUBLIC-HEALTH OFFICER

IV

THIS week has brought from the far corners of the Empire friends old and new with good tidings of an increased interest in communal health and of many fine beginnings in preventive and hospital projects But I do not wish to mitigate the picture I drew last week of the serious arrears to be overtaken in Colonial hygiene and the need for a *continuous* public effort at home and abroad There is always a danger that "long-term planning" may be left suspended in mid-air for lack of funds if a call arises for expenditure in another direction—and all health campaigns worthy of the name must be planned and financed for years ahead Not without reason one fears that Defence may be the enemy of Health unless the importance of the latter is fully appreciated

* * *

One has tried hard to keep A R.P out of these notes, but it gets under the skin with its constant reminders of the war years. All of us have, I suppose, our private list of the Minor Horrors of War which irritated most Mine included the depressing darkness of the streets . . . the shortage of small essentials like paper and wood . . the nagging difficulty of getting small repairs carried out . . and the curious way in which people were changed. Courteous and friendly shop-assistants and bus-conductors (whom I usually find as wonderful as visiting film-stars find our policemen) become insolent and unhelpful We have all to be under Authority in war-time and one found that power descending on unaccustomed shoulders brought out unexpected dignity and competence in some but also gave the bully and sadist chances they never get in time of peace

One minor nuisance, which at times assumed major importance, is worth recounting as it is more amenable than most of the above to prophylactic measures I refer to the habit of untruthfulness and slandering which becomes epidemic during hostilities The Russians in England and the Angels at Mons were harmless enough, but the War Babies legends were not so good for national prestige, and the reckless slanders on cabinet-ministers and on anyone high or low with German connexions were very bad indeed Indescribable unhappiness was caused and several innocent persons who had made great sacrifices for their country were driven to suicide Looking back one wonders whether the hate engendered by officially tolerated—or even fostered—atrocity stories may not have played some indirect part in producing the present unhappy situation It did no-one any good to gloat over the notion of women with breasts hacked off or babies with hands cut off at the wrist By an odd chance I was able to investigate several of these legends The women with amputated breasts turned out to be a couple of ordinary cases of carcinoma mammæ seen by visitors to a ward where there were also Belgian refugee patients One alleged victim of the Bolsheviks was a Polish refugee baby who, as his father anxiously explained, had (*a*) never seen a Bolshevik, and (*b*) been born like that! Another Belgian baby without a hand and forearm also turned out to be a case of congenital deformity Not a single authenticated case of deliberate mutilation was ever traced, but certain newspapers went on repeating the stories till the end of the war. The Scots had a better way. Quite early in the war an old law against "leasing"—i e, spreading lies to the public detriment—was revived and at least two people (one a town councillor) were prosecuted under it, to the great benefit of public morale In England it is possible that the law against "creating a public mischief" might be utilised to the same useful purpose, if occasion again arose

* * *

The war recollections most vivid just now are those associated with the evacuation of children More power to the elbows of those engaged on this good work; but I think there is a tendency to exaggerate the effect of the whole business on the nervous system of the child The Spanish experience confirms the impression formed by many of us who were in bombed areas in the last war, that children suffer much less than adults from alarm during raids. Their attitude is largely determined by that of the adults who have charge of them One noted this in the first war refugees one saw—i e, the horde of Belgians and French who poured into Calais before the rapid German advance at the end of October, 1914 I helped to feed the refugees in the canteens there and it was remarkable how quickly they regained normal calm and cheerfulness after a meal and a sleep Later, in the East End of London the frequent raids put children under considerable strain but they stood up to it uncommonly well

The morning of the first daylight raid (in June, 1917) found me examining children in a special school for mental defectives (From that simple statement you may gauge the difference in the calls on the medical profession then and now) The little M.D.'s were certainly a bit pale and jumpy but their sleep had been badly disturbed by almost nightly vigils in the overcrowded Underground stations which were then the only refuges. "Being dragged about like a sack o' pertaters" as one little boy indignantly described it Suddenly the air-raid warning sounded and a little later came the bursting of shells. The children's attention began to wander even from the absorbing tests of Messrs Binet and Simon "Wa, it the 'Uns?" It was . At 11 50 a terrific bang shook the school and the children ran whimpering from their class-rooms into the hall. A tiresome little girl began to relate horrific anecdotes derived from a brother home on leave, and it was some minutes before the head-teacher could persuade them that the wicked "Tobes" (Taubes) were on their way home by now. "But how am I to get the children home" whispered the head; "they'll want their dinners and heaven knows when the all-clear will come" This would never do, so I slipped out through the deserted streets and bought an armful of buns On the way out I called in at the school for physically defective children downstairs to see how the many cardiac cases (some very severe) were bearing up. "Very well, thank you!" The teachers had started community singing and an elderly attendant serving lunch had broken into song with a highly successful comic effect At about 12 30 the all-clear sounded, the M D children cheerfully scampered off home with mouths full of bun. Then I realised how near

we had been to tragedy In a neighbouring school a bomb had passed through the boys' department and killed 2 boys, through a girls' class room and killed a girl, and then exploded in the babies' room and killed 15 Round the school gates stood a crowd of stricken people, mostly women with a few young men in khaki and elderly civilians They neither moved nor spoke, but just waited patiently to know the extent of the calamity Firemen from the docks were clearing the bodies from the wrecked infants' department and already a row of queer little dirty bundles lay under the playground shed In the doorway I met one of the firemen with some thing in his arms a thing like a charred rag doll with one torn limb protruding to show what it had been Tears were pouring down his blackened face and the policeman who had the bundle in the shed beside the others was weeping too Later we learnt that very few if any children had been merely injured There had been no panic anywhere in the building Incredible as it may seem the five year old children in the next room to the fatal babies' room did not leave their seats when the bomb burst The teacher made them fold their hands and say a prayer and their confidence never wavered. Moreover 50 stalwart infants presented themselves at 2 o'clock for afternoon school and were very disappointed that business was not as usual One of the teachers suffered for a time from nervous shock but none of the children had any untoward after effects that we ever heard of

The next air raid was mercifully less tragic I had somehow been inveigled into judging at one of those detestable functions, a baby show The raid took place half an hour before the show was due to begin, but hardly an entrant failed to appear and no mother mentioned the raid

It was good to see from these and other episodes of what finely tempered metal the outwardly soft Londoner is forged Perhaps that is the true purpose of nationalism—to make one realise of what great things people of one's own stock are capable, and to put heart into one's efforts to overcome imperfections

* * *

Later I was privileged to serve with two of the women's uniformed services and a new world opened up The medical supervision of women living in camps and in aerodromes, the inspection of quarters, the technique of medical boarding and many administrative problems effectively stopped one from worrying who was going to win the war In addition one had to wrestle with the Treasury, as St Paul fought the wild beasts at Ephesus, to get reasonable treatment for oneself and one's staff I was blessed above any woman's deserts in the chiefs and colleagues (male and female) which a kind fate provided both in the Q M A A C and the R A F, and only one unsatisfied query remains from those crowded years Why does the spectacle of a woman in uniform arouse such hostility in the breasts of many otherwise admirable human beings? Common sense might suggest that the replacement of men of fighting capacity is of urgent importance in wartime or the heads of combatant services and the Treasury would not sanction the scheme, that it is impossible to employ women in close association with men in camps and barracks without putting them into some sort of uniform, that they must be under some sort of formal discipline, and finally that any persons—men, women, or children—who have to be moved about in groups must be drilled and taught to march It is all as simple and inevitable as that! Yet even the bland announcer of the B B C in describing the Hyde Park review interrupted his paean of praise to drop some childish and "catty" comments on the new Women's Auxiliary Territorial Service—whose members by the by make considerably more sacrifices than the women in more fashionable services We shall indeed be foolish if we attempt to create rivalries or discords in the symphony of essential national service

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By Medicus, M P

Another week of Peace passes by. Twelve thousand naval reservists are called up for July 31, thirty thousand militia begin their six months training British forces, including British aeroplanes, take part in the celebration of the French Revolution on July 14 in Paris Britain and France agree to give Poland some eight and a half millions to help her maintain her army on a mobilisation footing The Soviet Mongol army defeats the Japanese-Manchukuo army Negotiations begin in Tokyo about Tientsin outrages on British subjects General Franco says Spain will remain neutral in a future war unless her vital interests are affected Hong-Kong brings in conscription for British subjects A Japanese crowd try to break down gates of British embassy in Tokyo Foreigners are expelled from the Tyrol And so on

In these circumstances the ordinary threat and counter threat of the parliamentary battle changes its character For this Parliament of Great Britain knows how to coöperate as Mr Lees Smith observed in the short discussion on the Members' Fund Bill, when the occasion demands

Civil Defence has now rambled through its last phases—on the existing bill at least—and the Lords' amendments have been considered How satisfactory or unsatisfactory medical arrangements are to be will be found out by experience But the bill does not so much lay down details of organisation as give powers and powers of a very sweeping character And on the medical side they are powers which ought to be used to the full at once The powers conferred on the Minister and on the local authorities are enough to make a good organisation and a workable organisation possible, but it will only be done by a general all round coöperation of all concerned and with not too much red tape about it

* * *

On Friday last, after a discussion on overseas trade, the final stages of the Milk (No 2) Bill were taken and the Minister announced that now there really would be milk available for expectant and nursing mothers and children under five and there was now no limit of money The scheme last year —promised then with equal confidence by the then Minister—did not bring about the supply of milk for the mothers and young children because of the Ministry's failure to get agreement as to distribution. This time the Minister promised that the distribution should not be held up The Milk Marketing Board agreed and he hoped and expected the distributors would agree too But if they do not then other

means of distribution will have to be found, although this was not stated in the debate. What was stated however by Sir Reginald Dorman-Smith, third Minister of Agriculture in the reign of Prime Minister Chamberlain, was that the Government could make no estimate of how long it would be before their methods would result in clearing out bovine tuberculosis and guaranteeing milk against other infections. On which it was proposed by the Opposition that the Government should introduce a one-clause bill giving power to local authorities to institute pasteurisation whenever or wherever the condition of the milk required it.

During this debate there were sometimes less than 40 members in the Chamber, so that the debate could at any time have been held up by the call for a "count" so as to bring it up to this minimum 40 which is the quorum But it was not lack of interest in milk or in public health which caused this. For on one day of the Finance Bill debate there was an actual count A day too on which Sir John Simon made a statement that the amount required for defence must be increased by 170 million pounds Despite the fact that these defence preparations make such a military rattle as to drown the sound of ordinary debate a good deal of ordinary parliamentary business is going on all the time.

* * *

The health and housing committee of the Conservative Party met to consider the next step with regard to the medicine stamp duties The fact that the Chancellor of the Exchequer was forced to abandon his attempt to repeal these duties this year by the consensus of opinion in the House lays a heavy responsibility on those who opposed this course. This Conservative committee, whose chairman is Sir Francis Fremantle and whose secretary is Captain G. S. Elliston, decided to ask the Chancellor and the Minister of Health jointly to receive a deputation who would submit suggestions for a revision of the stamp duties and for legislation to secure control of proprietary and other remedies in the interest of public health The Government is also making moves in the same direction and the Labour Party have their own suggestions. It is to be hoped therefore that before the next budget a scheme will have been generally agreed upon. The scheme should, as the select committee proposed, be one to control not only medicines but also quasi-foods, quasi-beverages and instrumental appliances of one kind or another.

If Peace breaks out, we shall get a good many things done and, if not, DORA may be even more expeditious

FROM THE PRESS GALLERY

Milk Bill

WHEN the Milk Industry (No. 2) Bill was considered in Committee in the House of Commons on July 12,

Dr. EDITH SUMMERSKILL said that the most undesirable feature of the bill was that the taxpayer was being asked to subsidise accredited and standard milk which was neither clean nor pure nor safe. Not one penny should be given to producers of this kind of milk. Forty per cent. of cows had tuberculosis, and it was these cows that were producing accredited and standard milk. Every year 2000 children died as the result of infection from milk which was called standard and accredited. Three-quarters of the cases of St. Vitus' dance, and three-fifths of the cases of infected bone in children were due to infected milk Yet the Minister had the temerity to say that he intended to subsidise this milk, which was a danger to the community. Nobody should profit by producing such milk, and the Minister should reconsider the schedule.

The schedule was agreed to, and the Committee stage concluded.

CHEAP MILK FOR LOCAL AUTHORITIES

The bill came up for third reading on July 14, when the Minister of Agriculture indicated the provisions of the cheap milk scheme, and said the Milk Marketing Board was ready to submit a scheme to him at an early date.

The Government had reviewed the question of the loss likely to be incurred by the board in such a scheme, and had decided to make an Exchequer grant available for the period to the end of September, 1940, at a rate sufficient to ensure the board a return of 1*s.* 2*d.* a gallon on the average over the year. This figure had been reached on the basis of the experience of the Special Areas schemes The rate would be reviewed in the light and experience gained during the year. The main features of the new scheme would be on the lines of the scheme in Scotland Milk would be made available to local authorities for maternity and child welfare schemes at a reduced rate of 2*d.* a pint. The distributive allowance would not be more than 8*d.* a gallon. Local authorities would be able to authorise free milk, or milk at part payment on the full payment of 2*d.* a pint. The balance of the cost of milk supplied at less than 2*d.* would, as at present, fall on the local authority's funds. The Exchequer contribution was to enable them to sell at 2*d.* a pint. Each authority which wished to participate would prepare its proposals and submit them to the Minister of Health, who would coordinate them. There would be no limit to the amount of grant that could be made by the Treasury. The only limit would be the amount of milk they could get down the throats of mothers and children.—Dr. HADEN GUEST said that, as a convinced advocate of the value of milk, he had always been held back by the thought that milk was not an absolutely safe fluid for children to drink. Every doctor would be an enthusiastic supporter of a "drink more milk" campaign if the Minister introduced a bill for pasteurisation.—The bill was read the third time.

Docking and Nicking of Horses

In the House of Commons on July 12, Sir R. GLYN asked leave to introduce the Docking and Nicking (Prohibition) Bill, to prevent the docking and nicking of horses and the importation of docked and nicked horses. He said that a similar bill passed through all its stages in the House of Lords last session and certain amendments were inserted which the promoters of the present bill proposed to adopt. Under the existing law the operation of docking was illegal, unless performed by a veterinary surgeon, and the animal must at the time be completely anæsthetised But the horse was undoubtedly subjected to torture, as a result of the operation which was unnecessary. The only excuse for docking, other than fashion, was that it took more time to keep the animal clean if it was not docked. That was giving way to laziness If a horse's tail was docked and it was stung by flies the animal's nervous system was broken down and in time it became ill-tempered. Every country in Europe had now adopted a similar scheme Under clause 2 of the bill, it was provided that a certificate of a veterinary surgeon should be obtained if the health of a horse's tail was affected. In other words, docking in future would be part and parcel of veterinary science for health reasons alone. It was provided that the act should come into operation on Jan 1, 1940. In March at a conference of the veterinary services of Europe at Munich it was unanimously agreed that docking should be made illegal and, owing to the rapidity of totalitarian law-making, Germany had already passed a law to the effect.

Leave was granted and the bill was brought in and read a first time.

Malnutrition

In the House of Lords on July 12, the BISHOP OF WINCHESTER called attention to malnutrition and asked H M Government if they proposed to take further steps to provide milk either at a reduced price or free to expectant and nursing mothers, children below school age, and children now at school The figure of 92 per cent admitted as fit to the Militia might suggest there was really no serious malnutrition in the country But there was a somewhat startling contrast between these figures and the figures for entrance to the other armed forces Not long ago 60 per cent of applicants for the Army were rejected on physical grounds, and 35 per cent of applicants for the Air Force had been rejected Was this a result of the fitness campaign, or a change of standards?

The effect of malnutrition on infant mortality was shown in the following figures In the well-to-do classes it was 30 infants per 1000 population, in the working classes 70, and among the unemployed 100 per 1000 Maternal mortality was closely connected with nutrition In 1934 the rate in Wales was very serious, and reached in part of South Wales over 11 per 1000 Then free meals were given at the clinics, and the next year the rate had fallen to a little over 4 per 1000 The one difference apparently was that in the earlier year they had insufficient food, and in the next year had sufficient food

The causes of malnutrition were two—partly ignorance, but much more largely low wages There was a strong case for a policy of family allowances, but there were serious difficulties, including the opposition of the Labour Party and the trade unions

A more direct way of dealing with malnutrition was by further provision for cheap and free milk. It was deplorable that the money set aside under the Milk Act last year for providing milk to expectant and nursing mothers and children under school age had not been used He hoped the Government would make it plain on whom the blame rested A large amount of milk went into the factories every week, at a much lower price than it cost to supply school-children with milk We were not in the position of another country where the choice had to be between guns or butter He was asking for guns, butter and milk The health of the people was as necessary for national defence as the armaments that might have to be used

Lord SNELL said that to feed hungry children was not only right in itself but was a good national investment The child was the child not only of John Smith, but of John Bull The trade union difficulties in regard to family allowances were serious ones, that some inquiry should be made to allay their fears

Lord HANKEY said that as Secretary to the Committee of Imperial Defence he was profoundly shocked and humiliated by the fact that year after year more than 50 per cent of the men offering for enlistment in the Army were rejected for physical and medical reasons The late Sir Walter Morley Fletcher, then secretary to the Medical Research Council, assured him that the defects which caused these rejections were curable by proper nutrition, but that it took at least 15 years to translate research into action in such matters Because of the satisfactory results in enlistment for the Militia they must not desist THE LANCET pointed out that there was no specified minimum of height, weight or chest measurement for the Militia, and that some of the men with minor defects of feet and vision who were placed grade 2 (a) of the Militia, would be rejected for the Regular Army, and that even for the Regular Army the standard was lowered in 1936, and since 1937 recruits had not been rejected on dental grounds

The last report of the Medical Research Council stated —

"Only by improving the general health and eliminating disease can it be hoped to reduce this present tendency of ever increasing medical services and the annual expenditure of between £200,000,000 and £300,000,000 which such services necessitate"

How could economy, which was never more important than today, and efficiency in national health, which was never more vital, be achieved? The answer was to be found in that enlightened report of the League of Nations Mixed Committee on Nutrition, 1937 The Medical Research Council had succeeded in condensing the main results into a very few words

"A much greater consumption of milk and other dairy products, of eggs, of vegetables, including potatoes, of fruit, and of fat fish, at the expense of bread, biscuits, sugar and sweets, especially in early life is an urgent national requirement, it will not only improve the physique of the people but will reduce the amount of dental decay and greatly raise the standard of health An increase in breast feeding will still further reduce the high mortality rate of infants from gastro intestinal troubles and bronco pneumonia Whatever advances in medical knowledge may come, until these simple precepts are adopted there will still remain a great deal of preventable disease in this country"

The tragedy was that people did not know how to begin Next to nothing was taught about nutrition in the schools Now that the facts were established the time had come for a great national work of education and propaganda

The task of public enlightenment should not be very difficult The tremendous Governmental machinery on health questions was ready to hand From the cradle to the grave the bulk of the people were accessible all the time to medical advice and instruction The influence of the Government could be powerfully exerted through this machine if a real effort were made

Viscount ASTOR said that the great need was for cheaper and safer milk Up to date the medical profession had not been able to act with complete vigour because it could not be guaranteed that the milk was reasonably safe It was necessary for the Government to see that the milk-supply was safer, and he regretted that proposals towards this end in the Milk Bill introduced last December had been dropped from the present bill Interim reports on the experiment supervised by the Advisory Committee to the Milk Board, of which he was chairman, to ascertain the effects of different milk rations on children, had so far brought out that in growth and weight children who received a single ration of milk improved more than those who got none, that children who got a double ration improved more still, and that there was substantially no difference between giving children raw milk and pasteurised milk This was very important owing to the prejudice in some minds against pasteurisation Farmers were short sighted if they opposed the pasteurisation of milk which did not come from tubercle free cows It was to their interest to get the backing of the medical profession for a "drink more milk" campaign, but they would only get that backing if the milk-supply was rendered safer

Viscount DAWSON OF PENN said the Militia represented all classes, and they would expect to find better average health among them than among ordinary applicant for the Army, partly because Militiamen were sufficiently young to have profited from the improved knowledge of feeding, and partly because ordinary entrants for the Army contained a larger proportion of those down on their luck and not under parental care Above everything else there must be a sure supply of fundamental and protective foods, and a supply of fresh food such as milk, vegetables, eggs and the like Such forms of food were of greater importance to us to grow in this country than corn and cereals, which could be stored but dairy produce and green vegetables must be freshly produced

Was it unfair to say that government after government had been like unto Pharaoh in the obstinacy in regard to the pasteurisation of milk? Outbreaks

of diphtheria and scarlet fever had been proved over and over again to be due to milk

Earl DE LA WARR, president of the Board of Education, said that the value of reports of school medical examinations was to some extent vitiated as there was not as yet any objective or exact method of measuring nutrition or malnutrition. Based on the experimental schemes started in 1936–37 for the supply of milk to mothers and children under five in the Special Areas (from which up to date just over 20,000 persons had benefited, consuming something over a million gallons of milk), it had been the Government's policy since 1937 to secure a reduction of price for milk to local authorities for supplying mothers and children under five. The Government estimated that if they were able to put this reduction in price into operation it would mean an increase in the consumption of milk for this purpose of from something over 3,000,000 gallons a year to something over 20,000,000 gallons a year. The latest figures showed that in England and Wales there were 2,500,000 children paying for their milk in schools, and a further 500,000 were receiving it free.

Replying to a point raised by the Earl of Cork and Orrery, who had said that the operations of the Milk Marketing Board had cost the voluntary hospitals a quarter of a million, and that children could get milk at school but if they went into hospital they did not, Earl DE LA WARR said that they had lately been able to make arrangements for a sick child to call at school for his bottle of milk, or in some cases to arrange for it to be taken to the child's home. He would inquire into the point about hospitals, which was a new one

Last year over 22,000,000 free meals other than milk were provided—more than double the number provided ten years ago School canteens were springing up, particularly in the rural areas, for children who came from a distance, and local authorities were making increased use of their powers to provide free solid meals.

The House to House Collections Bill (formerly the Charitable Collections Regulation Bill) was read the third time, and passed.

QUESTION TIME

JULY 13–19

Chairmanship of Dental Board

Mr WEDGWOOD asked the Paymaster-General, as representing the Lord President of the Council, whether he was now in a position to state whom he had appointed as the chairman of the Dental Board of the United Kingdom — Earl WINTERTON replied: The first chairman of the Dental Board, the late Sir Francis Acland, who died on June 8 last, was appointed in 1921 and reappointed from time to time The period for which he was last appointed would have expired on July 28, 1939, and the provisions of the Dentists Acts preclude the actual appointment of a successor until that date The Lord President, however, has invited Mr. E L Sheridan, F R C S I, L D S I, professor of dental surgery in the National University of Ireland, to accept appointment and Mr Sheridan has accepted the invitation

Mr WEDGWOOD Is the noble lord aware that there is great resentment among British dentists, in view of the Irish hostility towards Great Britain, at the appointment as chairman of the British Dental Board of a Sinn Fein Irish catholic living in Dublin?

Sir FRANCIS FREMANTLE asked whether, inasmuch as the Irish Free State had its own dental board, he would reconsider his decision and nominate a British practitioner for the vacant chairmanship of the Dental Board of the United Kingdom —Earl WINTERTON replied: No, Sir The existence of a dental board in Eire does not seem to the Lord President to be relevant to the question of the appointment of the chairman of the Dental Board of the United Kingdom, one of the members of which, as I would remind my hon friend, must under the provisions of the Dentists Acts be elected by qualified dentists practising in Ireland.

Captain ELLISTON asked whether he would reconsider his intention to appoint a practitioner in the Irish Free State as chairman of the Dental Board of the United Kingdom, in view of the fact that of 14,722 dentists on the British register only 160 practised in the Irish Free State.—Earl WINTERTON replied. No, Sir As my hon friend is aware, Mr. E. L. Sheridan has accepted the Lord President's invitation to succeed the late Sir Francis Acland as chairman of the Dental Board of the United Kingdom. Mr Sheridan, who has been a member of the board for many years, was last elected by qualified dentists practising in Ireland, which expression under the Dentists Acts mean the whole of Ireland, inclusive of Northern Ireland At the date of Mr Sheridan's election the number of qualified dentists on the United Kingdom register practising in Eire and in Northern Ireland were approximately 161 and 285 respectively. I may add that Mr Sheridan's election was unopposed.

Income-tax and Sickness Benefit

Mr. GREENWOOD asked the Chancellor of the Exchequer whether he proposed to take any action with respect to the decision of the Special Commissioners for Income Tax that sickness and disablement benefit from approved and friendly societies, trade-unions and other bodies are liable to income-tax —Sir JOHN SIMON: I saw certain comments on the matter which were communicated to the press this morning, but I am informed that they are materially inaccurate The decision referred to involves no new point of principle at all. Nor is the practice changed. Income-tax, where due in such cases, is not and will not be deducted at the source The actual case was that of a permanently disabled individual with a not inconsiderable private income which is supplemented by substantial payments derived from an insurance company and a friendly society. His total income is much above the exemption limit and the payments, which are treated by the Special Commissioners as in the nature of annuities, have continued for some years It is not the practice to charge benefits for periods of less than a year, no recipient with an income under exemption limits can be affected, and no new field of taxation is opened by the decision I may add that benefits under the National Health Insurance acts and unemployment insurance benefits are not treated as liable to income-tax, nor will they be

In reply to a number of further questions, Sir J SIMON said: There has been no general ruling in regard to income from trade-unions or approved societies This was a particular case decided by the Special Commissioners as a particular case The position is exactly the same as in 1925 or any later year.

Consultant Ophthalmologists for the Militia

Mr RITSON asked the Minister of Labour if he would consider appointing an expert oculist on to the panel of medical boards who were examining recruits for the Militia —Mr ERNEST BROWN replied Each medical board has been given the names of one or more qualified ophthalmologists to whom they can refer men for examination where they consider this to be necessary

In reply to a further question Mr BROWN said the number of references was not sufficient to justify a full-time officer being appointed.

Civil Defence: Surgery Courses

Miss RATHBONE asked the Minister of Health whether he would consider arranging through the appropriate authorities for courses in first-aid war-time surgery to be provided for those medical practitioners whose practice did not normally include such surgical experience —Mr. ELLIOT replied The eminent medical men who are acting as group officers in the various areas, most of whom have had much war-time experience, are I understand selecting doctors with adequate surgical experience for duty in the casualty receiving hospitals I doubt whether the step suggested by the hon member would be of use

Miss RATHBONE: Will the right hon gentleman consider the fact that in war-time practically all the doctors will be busily engaged giving first-aid treatment in bombing areas, and is he aware that the proposal outlined in the question has behind it a good many medical [illegible]

titioners who feel that they had had so little surgical experience that they would be at a disadvantage in time of war even in giving first-aid treatment."—Mr ELLIOT If the hon lady will bring forward any information in her possession I will take it into account

Mustard-gas Blindness

Mr ROSTRON DUCKWORTH asked the Minister of Pensions the number of new cases of blindness by mustard-gas which had been accepted by his department during the last three years, and the number of claims in respect of such disability which had been rejected.—Sir W WOMERSLEY replied Seventy-eight cases of impaired vision, including blindness, due to injury from mustard gas have been accepted (for pension) during the last three years, this figure includes 57 cases in which there has been a previous award for another disability or other effects of gas No claims which have been established as resulting from mustard gas have been rejected

Nursing Committee's Report

Mr ASHTON asked the Minister of Health whether he could now indicate the action it was proposed to take with respect to the recommendations contained in the report of the Interdepartmental Committee on the Nursing Services including the question of superannuation and the transfer of superannuation rights.—Mr ELLIOT replied Yes, Sir With regard to training and education I have already approved amendments by the General Nursing Council of the rules governing the preliminary examination, in accordance with the committee's recommendations These amendments have taken effect, and the President of the Board of Education will in a few days issue a circular on the question of training courses With regard to general conditions of service, I am shortly issuing a circular to local authorities on various recommendations of the committee The question of superannuation, with some other questions, is still under review

Free Meals for Welsh Children

Mr EDWARD WILLIAMS asked the Parliamentary Secretary to the Board of Education the number of children in receipt of free meals and free milk in elementary and secondary schools in the county and county borough areas of Wales and the proportion of the full complement on the registers.—Mr KENNETH LINDSAY replied In May, 1939, 5382 children in public elementary schools in Wales and Monmouthshire, including county and county borough areas and boroughs and urban districts which are local education authorities for elementary education, received free solid meals, 3248 free meals and milk and 60,416 free milk only, 3 1 per cent of the children on the registers received free meals and 18 per cent free milk In the secondary schools free meals and milk are usually given by means of maintenance allowances, but no information is available as to the number of children who receive them in this way

Local Authorities and Hospitals

Mr SILKIN asked the Minister of Health how many hospitals formerly maintained and managed by poor law authorities had been appropriated as public health institutions under the powers contained in the Local Government Act, 1929, and how many of such hospitals were under the control of public-assistance committees.—Mr ELLIOT replied Out of a total of 79 hospitals in England and Wales recognised as poor law hospitals under the terms of the Public Assistance Order, 1930, 61 have been appropriated to public health purposes and 18 remain under the control of the public-assistance committees

Silicosis in South Wales

Mr JAMES GRIFFITHS asked the Home Secretary the number of applications received and the number of certificates granted for total and partial disablement, and certificates that death was due to silicosis among coal miners in the United Kingdom in the 18 months ended to the last convenient date, under the Various Industries (Silicosis) Schemes, and if he would give separate figures for the anthracite coalfield and the rest of the South Wales coalfield; and if he would also give particulars of the grade of employments, and the number of certificates in each grade, respectively.—Mr PEAKE, under secretary, Home Office, replied Applications to the medical board for certificates under the Various Industries (Silicosis) Schemes from coalminers were as follows:—

—	Total	South Wales excluding anthracite mines	Anthracite mines
Disablement or suspension			
Applications for certificates	1306	521	470
Certificates granted	678	275	324
Certificates refused	628	246	146
Deaths			
Applications for certificates	173	89	48
Certified as due to the disease	109	53	28
Certificates refused	64	36	20

The particulars asked for in the last part of the question are not available

British-made X-ray Apparatus

Mr HOPKIN asked the Minister of Health if he was aware that advice was being given to hospitals purchasing deep therapy X ray apparatus that foreign firms could produce better equipment than British firms, and that as a result of this advice several installations of foreign apparatus had been made, and if he would consider issuing a circular to all hospitals recommending them to make use to the utmost extent of the British made X ray equipment.—Mr ELLIOT replied I am not aware that any such advice as is referred to in the first part of the question is being given As regards the second part, my department has issued a circular to local authorities recommending them wherever practicable to make use of goods and materials of home production, but I have no authority to issue a similar circular to voluntary hospitals

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PLASTIC SURGERY CONGRESS.—The fourth international congress organised by the Société Européenne de Chirurgie Structive will be held in Paris from Oct 5 to 7 The hon president of the congress is Prof P Sebileau, and the president is Dr L Dufourmentel The main subjects for discussion will be the treatment of deformities resulting from scar retraction of the eyelid, and the treatment of deformities of the jaw Further information may be had from the secretaries of the congress, 9 rue de Turin, Paris VIII

EXTENSIONS AT HARROGATE SPA.—On July 10 the Lord Mayor of London opened the extension to the Royal Baths at Harrogate The new building which has been built at a cost of just over £80,000 is capable of providing one thousand treatments a day, all of which use, in one form or another, the natural mineral waters of Harrogate The new wing is connected to the existing buildings by promenades surrounding a central fountain court In place of the old glass covered winter gardens a new lounge has been erected which forms a centre for the whole of the bathing establishment Treatments have been grouped for ease of administration and covered corridors will provide for internal communication between the various departments The entrance and corridors will be free from steps to enable bath-chair patients to have easy access to all parts In the new wing the ground floor contains sulphur baths and the first floor the intestinal lavage department, each with its own dressing rooms, cooling rooms and rest rooms. Elevated tanks containing the various mineral waters are arranged in the water tower which has been placed in a central position for distribution and the hot and cold sulphur alkaline and plain waters are gravitated to the various bathrooms and appliances

Under a new scheme it will be possible for patients to receive medical attention and all baths waters and treatments required for a complete cure are at fixed inclusive charges of 5 guineas for two weeks or 7 guineas for three weeks Hotels in the town are co-operating by quoting reduced fees for patients coming to Harrogate under this new scheme It will thus be possible from the outset for patients to ascertain the exact cost of a cure

OBITUARY

JOHN MELLANBY
MD CAMB., F R S

John Mellanby died on July 15 He was a great physiologist and a great teacher. He was respected by all who knew his work, and loved by his colleagues and assistants

The family was a brilliant one His elder brother is Prof Alexander Mellanby of Glasgow, while his younger brother is Sir Edward Mellanby. The three brothers went to Barnard Castle School, in their native county. At Cambridge John took a first in both parts of the natural sciences tripos, and then became physiologist on the staff of the Burroughs Wellcome laboratories at Battersea, where he joined a group which included Sir Henry Dale and George Barger. After 3 years in this laboratory, he entered Manchester University to complete his clinical studies. His Cambridge M.D. thesis gained for him the Raymond Horton Smith prize, and he spent the next 2 years in the Cambridge physiology laboratory as G. H Lewes student Then, in 1909, when only 31, he succeeded J B. Leathes as head of the physiology department at St Thomas's Here he remained for 25 years, becoming professor in 1920 He was elected an F R S. in 1929, and was a councillor of the Royal Society at his death In 1936 he went to Oxford as Waynflete professor of physiology. He was a fellow of Magdalen, a member of the Medical Research Council and a former editor of *Physiological Abstracts.*

Mellanby always said that work on a new aspect of physiology was a relief and a stimulus to thought In consequence his name is linked with researches over a very wide field. But the connecting thread throughout was always an objective biochemical examination of physiological phenomena At Cambridge he had been a pupil of Langley, Hardy and Hopkins, and the influence of Hopkins was responsible for his interest in biochemistry. His first papers, now regarded as classics, were concerned with globulins and the physical properties of serum. In these Hardy's pioneer work in colloidal chemistry is traceable, and throughout his life Mellanby always emphasised the fact that the body was a series of colloidal solutions, whose properties continually influenced the functions of the organs and tissues

His early work on protein was followed by a systematic examination, with his colleague V J Woolley, of the enzymes of the pancreas The study of lipase led him on to demonstrate the particulate absorption of unhydrolysed fat through the agency of bile salts. He disentangled the parts played by the vagus and secretin in pancreatic secretion. He showed that prosecretin, said to be activated by hydrochloric acid, was a myth, and that secretin itself was present in the duodenal mucosa, thus explaining why achlorhydrics had an adequate pancreatic flow. He purified secretin and showed it to be a proteose, and drew attention to the rôle of bile salts both in secretin absorption and in biliary secretion. The great range of his researches covered also the action of the bladder, the relation of the nervous system to the blood-sugar and glycosuria, the nature of enzyme action, and anoxia, CO_2 carriage and CO poisoning. The pathologist owes him a method of concentrating diphtheria toxin and antitoxin and a way of stabilising colloidal gold for the Lange test. Almost his last publication was on splenomegaly which he produced when studying the function of blood-urease.

But running in and out through this diversity of researches was his work on blood-clotting He showed that prothrombase was not related to platelets, but was a protein in plasma forming a complex with fibrinogen. He investigated the actions of many snake venoms, showing the extreme coagulant effect of viper venom. After the war a much fuller recognition was given to his work, when he isolated and described the properties of pure prothrombase and thrombase, showing prothrombase to be a very labile water-soluble protein. In 1935 he showed that calcium ions were not fundamental for fibrinogen clotting but were made necessary by reason of the peculiarities of the plasma proteins

It will probably be some years before a true assessment of the real value of his scientific work will be made Appreciation of his high place as an investigator has grown slowly but certainly, and there is good reason to believe that even now his great capability is not rated at its true value. He only wrote when he had some outstanding discovery to report He considered himself a general physiologist and was prepared to investigate any problem that interested him It is doubtful whether any other living physiologist, working so often with a lone hand, has contributed so many facts to the science His methods were always simple His experiments were always capable of being repeated by others And repetition has always shown how wise were his conclusions

Mellanby came from the valley of the Tees He was apt to maintain that his name indicated viking origin. Be that as it may, he had a rugged austerity which made him difficult to approach. But beneath this one found a man of extreme shrewdness who had no use for humbug, a first-rate judge of character and a staunch fighter for the rights of the individual. His probity made him a loyal friend and, if he was sometimes brusque in his comments, his candour was justified But over all there was a gift of rapier like wit which never palled and made his friendship a joy This combination of honesty, candour, and humour made John, as he was called by all his students, a power in the land when discipline was called for and routine methods had failed. His lectures were a joy to listen to Every year subjects were approached from a new angle John never repeated himself His Socratic questions, addressed particularly to students in what he liked to call the stalls or the gallery, would often bring down the house He loved figures and would force the ignorant to convert pints of beer into litres of urine He sparkled sitting down and would "doodle" with chalk drawings

crosses inside circles inside squares which tradition said was a test for alcoholic intoxication in one of his earlier researches He was a great examiner and his original questions were designed to pick out of themselves the good and the exceptional candidate He was never afraid to give a high mark when he thought it deserved, sometimes to the surprise of the candidate

Prof A St G Huggett who contributed many of the details for this note recalls the joy it was to meet Mellanby and his wife and daughter Joan in their home at Englefield Green Mellanby got immense pleasure out of achievement of any kind, especially if this was associated with beauty His knowledge of and skill in gardening was very great Any free time in London often brought him to Christies, where he would purchase some beautiful but inexpensive example of craftsmanship and bear it home rejoicing to show to his family and intimate friends He bought articles because they pleased him and then proceeded to study the subject they represented His knowledge of antiques thereby became great He was, however, no showman, and his vivid interest in and knowledge of life was only appreciated by those who were closely associated with him

LETTERS TO THE EDITOR

OPHTHALMIC BENEFIT

SIR,—May I draw attention to the new developments that are taking place with regard to the administration of ophthalmic benefit under the National Health Insurance scheme Some years ago the British Medical Association entered into arrangements with the Association of Dispensing Opticians to form the National Ophthalmic Treatment Board (N O T B) The B M A.'s reason for this step was to encourage insured people and others of similar income status to consult a medical practitioner rather than a sight testing optician To this end very extensive propaganda and advertisement have been undertaken by the board, and the number of insured people availing themselves of the facilities offered is now so large that the N O T B look forward with confidence to the absorption of practically all ophthalmic work of this type Hitherto any practitioner who could show "reasonable ophthalmic skill" has been eligible on application to have his name included in the list of doctors operating the medical aspect of the scheme, and no body has had power to exclude any suitably qualified medical practitioner After a considerable agitation some twelve months ago the Ophthalmic Group Committee of the B.M.A. was made representative, but the medical representation on the N O T B remains largely executive, being directly elected by the group committee

It is important to recognise that the commercial side of the N O T B has received criticism It is not clear to everyone that the charges for spectacles under the scheme are equitable to the public in all the circumstances, and some have thought it undesirable that patients should be directed to ask a tradesman to arrange for them to see a doctor, especially as the tradesman is subsequently to sell them goods ordered by the doctor selected Others have found derogatory the keeping of ophthalmic appointments made by an optician in premises owned by that optician, and some doubt has existed both among medical practitioners and dispensing opticians as to whether such patients really belong to the dispensing optician or to the doctor, since the dispensing optician pays for the advertisement and provides the whole of the money for the N O T B organisation, by a levy on sales under the scheme

The N O T B is now to be made into a limited company, to protect its title, but advantage is being taken of this opportunity to alter the status of practitioners coöperating under the scheme We are invited to sign "form A" which is "an application for appointment for the conduct of ophthalmic examination and treatment on behalf of the N O T B Ltd" It is possible that the words "for appointment" may be changed to "to have my name placed on the list of practitioners approved for" The operative clause here is "on behalf of." The wording recognises the proprietary right of the N O T B in the goodwill involved The ophthalmologist thus asks to be permitted to see patients entitled to benefit under national health insurance "on behalf of" a limited company who, by advertisement and propaganda, have persuaded patients to place their ophthalmic destiny in their hands

Not content with forcing an existing practitioner, whose livelihood depends to a greater or less extent on the N O T B, to seek an appointment, the form requires him "to observe the conditions, rules, and regulations laid down by the B M A. from time to time" Insurance practice in ophthalmology is for the future to be dependent on our submission to conditions imposed by the B M A Further, this section authorises the Ophthalmic Group Committee of the B M A. "after due inquiry to take such action as it may consider appropriate in the circumstances" Such disciplinary action might well include expulsion There is no provision for appeal The next clause reads, "I agree to the condition that my appointment is terminable by one month's notice in writing on either side"

The final arbiter of our professional destiny is thus to be a limited company, whose board consists one-half of opticians, and which may terminate the appointments of its oculists just as it dismisses its errand boys—on one month's notice—such notice being of the same significance to an oculist as would be a similar termination of his panel practice to any general practitioner It is essential to the scheme that the names of all qualified ophthalmic practitioners must be submitted to every patient applying to be seen under the scheme The last paragraph reads, "I agree that failure on my part faithfully to carry out the above provisions or undertakings gives to the Ophthalmic Group Committee of the B M A full power to direct the N O T B to erase my name from the N O T B Ltd ophthalmic list" So that not only may his livelihood be taken away, but he may be for ever excluded from participation in the huge advertisement given to his more fortunate or more amenable colleagues A resolution proposing to include in form A a recognition that the case-records of patients seen are the property of the doctor, not of the optician, was passed at the general meeting of the ophthalmic group of the B M A on Friday last

The N O T B found its inception in the desire to provide a national ophthalmic service for the masses Due credit must be given to the B M A for the arduous pioneer work But the position at present is that a vast commercial enterprise has developed with

all the machinery of expensive advertisement, and this organisation is now in the position of a disciplinary body over ophthalmologists, whom indeed it is to employ in future. It is true that this commercial organisation is not to act without professional restraint, but it is questionable whether it serves a national or professional advantage to have a commercial organisation exercising such powers It must still be the object of ophthalmologists to organise a national eye service, but if the financial arrangements necessary for such a service cannot be developed by the profession, it seems to most of us that it would be more reasonable to have some public body in charge of such arrangements. The introduction of commercial interests into any national scheme of this kind would be regrettable at any time. When such a commercial organisation now seeks to exercise disciplinary action, the time has come to review the whole basis upon which a national ophthalmic service can function best.

I am, Sir, yours faithfully,

R LINDSAY REA,
President, Association of British Ophthalmologists

Harley Street, W 1, July 17

ABDOMINAL RESECTION FOR RECTAL CANCER

SIR,—Possibly comments aroused by Mr. E. G. Muir's article in your issue of May 13 will have come and gone by the time this letter reaches you, but I should like to welcome his paper as a sign of growing attention to the more "selective" procedures (to use a thoracoplastic analogy) in rectal cancer

The subject was discussed at the tenth Australian and New Zealand Cancer Conference held in Wellington last February, and in the course of a paper on conservative surgery in cancer of the rectum I referred to the pathological research of Westhues, about 1930, the recent St Mark's survey, and the clinical applications of these matters by such surgeons as Gehrels, Goetze, and Devine My own small personal series of 14 operable cases of rectal cancer fell into the following groups :—

(*a*) In 5 cases conservative resection was impossible because of the low situation of the growth.

(*b*) In 2 cases in which the anus was sacrificed, it might have been possible to save it in the light of more recent views.

(*c*) In 2 cases Hartmann's abdominal resection was carried out with permanent colostomy, but in cases similar to these occurring now I would attempt conservation of sphincter

(*d*) In 4 cases conservative resection (2 sacral and 2 abdominal) was carried out.

(*e*) In 1 case, very suitable for abdominal conservative resection, the procedure was not completed.

Thus half of the 14 cases had, or were suitable for, conservative resection. Similarly, in reviewing 26 radical combined operations at Auckland Hospital, I judged that 17 (or 65 per cent.) were suitable, on anatomical grounds, for saving of sphincter. Continental surgeons give high percentages of conservative resections—e g , Hochenegg 25, Kuettner 42, Finsterer 70 (quoted by Gehrels).

Mr Muir does well, therefore, to call attention to possibilities other than the standard perineal, perineo-abdominal, and abdominoperineal procedures. The basis for the conservative operations, with saving of sphincter, lies in the proven rarity of downward and lateral metastases, and its success has been made more general by improvements in technique, conspicuous amongst which I would place Devine's double-barrelled colostomy, and total "defunctioning" and disinfecting of the distal colon segment bearing the growth

I am, Sir, yours faithfully,

Auckland, N Z , June 29 DOUGLAS ROBB

REFERENCES

Devine, H B. (1937) *Brit J Surg* 25, 351
Gehrels, E (1937) *Surg Gynec Obstet* 65, 528
Goetze, O (1931) *Zbl Chr.* 58, 1746
— (1932) *Ibid*, 59, 873
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THE MANTOUX TEST

SIR,—In recording the results of Mantoux tests there is at present to my knowledge no concise way of doing so to show both dose and reaction It seems important that when these tests are repeated at intervals—e g , contacts, nurses in institutions—and perhaps by different medical officers, changes in sensitivity should be readily noted Hence the need for recording not simply a negative or positive reaction but both the dose and the reaction to it To make this recording concise I suggest the following.—

A. Record doses as follows .

1 mg as 1	0 01 mg. as 3	1 mg =1 is the important
0 1 mg as 2	0 001 mg as 4	figure from which to derive the others.

B Record reactions on the lines of the Aronson scale:
Aronson 0 and ? (reaction less than 5 mm) as 0.
Aronson + (reaction between 5 and 10 mm) as 1
Aronson ++ (reaction between 10 and 20 mm) as 2
Aronson +++ (reaction over 20 mm) as 3
Aronson ++++ (central necrosis) as 4

C. Record results of the Mantoux test as dose × reaction —e g , 0 01 mg O T giving a ++ reaction would be shown as 3×2

No virtue is claimed for the actual mathematical product, but it is suggested that the expression of dose and reaction as shown above has the merits of simplicity for the purposes of recording, and would show at a glance any significant change in reaction.

I am, Sir, yours faithfully,

R. S R FRANCIS.

Mecklenburgh Square, London, W C 1, July 11

LEUCO-ERYTHROBLASTIC ANÆMIA

SIR,—Hæmatologists have often been accused of complicating the terminology of their subject to such an extent as to make their specialised literature almost incomprehensible to the general physician and even to the majority of laboratory workers Interest in the nomenclature of blood-cells has waned very considerably since the death of Pappenheim, who did so much to differentiate between cells on the basis of minute tinctorial peculiarities ; but, even at its worst, such specialised researches were nothing more than the hobby of some hæmatological laboratory workers. More recently the interest has shifted from the classification of cells to the classification of "blood diseases," which, instead of being regarded as hæmopoietic reactions—as in most cases they are—have been hypostatised into maladies sui generis

This unfortunate tendency is exemplified in Dr Lucey's report in your issue of July 8 , for he suggests that "some cases of so-called acquired acholuric jaundice may really be unrecognised cases of leuco-erythroblastic anæmia," and he begs that we take care to exclude "the latter *disease* by a thorough search of the body for a primary malignant growth and by radiography of the bones for secondary deposits ." (my italics) Surely what is meant is that the discovery of a leuco-erythroblastic blood

picture is to be regarded as an indication for careful search for one of the known causes of such a change, and one of the known causes is the presence of metastases in the bone marrow There is no basis on which it can be claimed that leuco erythroblastic anæmia is a "disease", any more than it could be contended that the hypochromic anæmia that develops in cases of gastric carcinoma is a "disease" The blood is not a tissue but a mixed secretion, derived from various organs, which themselves may be the seat of disease Changes in the blood, like changes in the urine, are symptomatic and nothing more

My protest against the elevation of leuco erythroblastic anæmia to the status of a disease is, I think, important, because Lucev's article suggests that the absence of secondary deposits in the bones would make him revise his diagnosis of leuco erythroblastic anæmia The position is surely that leuco erythroblastosis is nothing more than the name applied to a special sort of blood picture The cause may be obscure, but even if it is not detected, the blood picture still deserves the same name

I am, Sir, yours faithfully,

Harley Street, W 1 July 11 A PINEY

SUNSHINE AND MENINGITIS

SIR,—Your issue of June 10 contains a letter from Dr Douglas Hubble on Sunshine and Meningitis When I was senior medical officer at the Nkana Mine in Northern Rhodesia in 1930 I had six cases of cerebrospinal meningitis in Europeans, and of these patients three were people who were known to go about regularly without hats Though six cases is an insufficient number on which to form any opinion, it struck me at the time that undue exposure to tropical sun might be a predisposing cause, and this appears to agree with Dr Hubble's theory, which certainly seems to be worth further inquiry

I am, Sir, yours faithfully,

Nanyuki, Kenya Colony July 8 G DUNDERDALE

THE PROBLEM OF MEDICAL LITERATURE

SIR,—With further reference to the discussion initiated by Prof McDowall, I should like to draw attention to a bibliographical tool not hitherto mentioned—namely, the "Subject Index to Periodicals," which includes the principal British medical journals among the 600 periodicals indexed It is published annually in one volume by the Library Association, and reference may be made to it at all university and most public libraries

The "Subject Index" is on the dictionary catalogue plan Entries are classified under specific subject-headings, which facilitates quick reference, and connexion is maintained between allied subjects by a system of easily understood cross references

The problem of obtaining access to any particular periodical is largely solved by the "location list" appended to each volume In this list—which is believed to be at present a unique feature in periodical bibliography—the periodical holdings of more than 170 national, municipal and institutional libraries are set forth in tabular form

I write in the hope that the "Subject Index to Periodicals," which has been functioning since 1915 along the lines indicated by previous correspondents, will prove of some value as a practical starting-point I am, Sir, yours faithfully,

T ROWLAND POWEL,
Editor, the Subject Index to Periodicals.

Chaucer House, Malet Place W C 1 July 17

HAVELOCK ELLIS

SIR,—Your obituary of Havelock Ellis emphasises his work in encouraging an enlightened attitude towards sex It refers only in passing to what must surely be considered the wider meaning of his life and work, his belief in the "basic identity of science and mysticism" It is as well to remember that to this clear thinker mystical experience was as "real" as the data of physiology or physics, for an unreal dichotomy in human experience is popular today, emphasised often by the partisan warmth of those who can see no other frame of reference than their own

Medicine at the moment pays at any rate lip-service to the concept of psychosomatic unity For a greater understanding of this, Havelock Ellis's *Weltanschauung* contains much that is of special value to us

I am, Sir, yours faithfully,

Kenneth Court, S E 11, July 16 C W M WHITTY

BLOOD-GROUPING OF THE POPULATION

SIR,—May I make a plea for a general grouping of all the population, into their blood groups, so that in the event of hostilities it would be an easy matter to supply blood of a suitable group to the injured person Also, it would be known where universal donors could be found quickly, or where universals could form a blood-bank for general use This would also be of value in cases of accidents, road or otherwise, for any hæmorrhagic emergencies

This could be arranged, either by the people attending at a pathological laboratory of a large county hospital, or the county medical officers of health I am, Sir, yours faithfully,

Lewes, July 12 J NICHOLL

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 8, 1939

Notifications.—The following cases of infectious disease were notified during the week Smallpox, 0, scarlet fever, 1870, diphtheria, 892, enteric fever, 32 (50 "expected"), pneumonia (primary or influenzal), 452, puerperal pyrexia, 209; cerebro-spinal fever, 32, acute poliomyelitis, 15, acute polio-encephalitis, 1, encephalitis lethargica, 5, relapsing fever, 1 (North Westmorland R.D), dysentery, 42, ophthalmia neonatorum, 91 No case of cholera, plague or typhus fever was notified during the week

The number of cases in the Infectious Hospitals of the London County Council on July 14 was 3000 which included Scarlet fever 750 diphtheria 546 (carriers, 18) measles 19 whooping-cough 787 puerperal fever, 20 mothers (plus 9 babies) encephalitis lethargica 306 poliomyelitis 6 At St Margaret's Hospital there were 20 babies (plus 10 mothers) with ophthalmia neonatorum

Deaths.—In 126 great towns, including London, there was no death from smallpox or scarlet fever, 1 (0) from enteric fever, 7 (0) from measles 10 (3) from whooping-cough, 28 (5) from diphtheria, 10 (11) from diarrhœa and enteritis under two years, and 10 (0) from influenza The figures in parentheses are those for London itself

Northampton reported the only death from typhoid Gateshead had 3 deaths from measles Birmingham 2 Birmingham also reported 2 deaths from whooping-cough Fatal cases of diphtheria were scattered over 20 great towns Luton Bradford Hull Leeds Liverpool and Manchester each reporting 2

The number of stillbirths notified during the week was 203 (corresponding to a rate of 40 per 1000 total births), including 12 in London

MEDICAL NEWS

University of Oxford

At a congregation on July 15 the following degrees were conferred :—

D M—W H Brown and R McDonald

B M, *Ch.B*—George Ashforth, J W Ashley, J F. Bourdillon, J T Burrowes, N F E Burrows, J W B Douglas, E S Elliott, F Fulton, S J S Hughes, R M Lattey, J A L Leeming, G K McGowan, J. N Mills, E S Nicholson, M M. Pickles, W A H Stevenson, T Sutton Coulson, S F Taylor, G Theophilus, G D Walker, G F Walley, and R T Warren

Staines Medical Research Fellowship—This fellowship which has an annual stipend of £400 is tenable at Oxford for a maximum period of five years It is open to candidates of British birth who are more than 35 They should preferably hold a registrable medical qualification. An election will be made in the course of the Michaelmas term and further information may be had from the rector of Exeter College.

University of Cambridge

A scholarship of the annual value of £100 or £60 is offered at Peterhouse to candidates who intend to study medicine It is open for competition by an examination to be held in December, 1939, and may be awarded for proficiency in mathematics, classics, natural sciences or history Particulars may be obtained from the tutor of the college.

University of London

At recent examinations the following candidates were successful :—

G W Boden, M L Mundy, Mohamed Nasiruddin, and Peggy C Permain

University of Birmingham

At a congregation on July 1 the following degrees and diplomas were conferred .—

Ph D—Stuart McDonald, M B

M D—C H Catlin

M D (State Medicine)—D F McCarthy and J V. Walker

M B, *Ch B*—P H Davison and B A E. Johns (first-class honours), P W W Gifford, P F J Hickinbotham, and Y D Williams (second-class honours); G M Barling, G H Boston, Anna R Burrows, H R Chapman, J S I'A Chesshire, Agnes H Crozier, Doreen Davies, Margaret B Davies, J A Duncan, T B FitzGerald, D C Galloway, A A Gattas, V. B Goldman, Marion W S Green, Paul Harris, D S Johnson, Harry Kenyon, Elizabeth B Lindsay, W K Lloyd, D J Macmillan, Lothar Marx, Percy Morrell, Margaret A Norton, D G Richards, Eleanor M Sawdon, Dorothy W Smith, E T M Smith, D H Thompson, and Margery B Webb

B.D S—J L Hardwick.

Diploma in Dental Surgery—H P Britten, B G Davies, I H Jones, John Kitchen, A J Vaughton, D E Wallis, and E W Wiley

University of Sheffield

Dr. Wilson Smith has been appointed to the chair of bacteriology in succession to the late Prof J. W Edington.

Dr Wilson Smith, who is 42 years of age, was educated at Accrington Grammar School He enlisted in the Royal Army Medical Corps in 1915, and served in France and Belgium with the 107th Field Ambulance B E F from 1916 to 1919 After the war he studied medicine at the University of Manchester and graduated M B in 1923 He spent several years in private practice and in 1926 took a postgraduate course in bacteriology The following year he obtained the diploma in bacteriology of the University of Manchester and was appointed research assistant to the director of the department of experimental pathology and bacteriology at the National Institute for Medical Research In 1929 he obtained the M D Manc., with commendation and joined the scientific staff of the institute, and in 1931 he was promoted to the senior grade of the staff In 1934 he was also appointed one of the editors of the *British Journal of Experimental Pathology* Dr Wilson Smith has published many papers, some in our own columns, on his investigations into the nature of viruses and virus diseases in general, on methods of standardisation and assay of anti-pneumococcus sera, and on the investigations of influenza pursued at the institute

Mr W. J. Lytle has been appointed hon lecturer in surgery to dental students, and Dr Andrew Wilson assistant lecturer in pharmacology.

The L C.C. and King's College Hospital

There is great need for additional hospital bed accommodation in South London, and the L C C. therefore propose to accept the offer of King's College Hospital to place a ward at the council's disposal. The council has already decided to erect a new hospital in South London, but this is unlikely to be available before 1942.

Royal College of Surgeons of England

A quarterly meeting of the council was held on July 13 with Mr Hugh Lett, the president, in the chair. Mr. Lett was re-elected president, and Sir Robert Kelly and Sir James Walton were elected vice-presidents for the ensuing year. Sir James Walton was readmitted, and Mr R J. Willan and Mr. Cecil Joll were admitted to the council Dr. Donald Balfour (Mayo Foundation) and Prof Peter Bull (Oslo) were admitted as honorary fellows The John Tomes prize was presented to Mr Arthur Bulleid and the Hallett prize was awarded to Mr W. M. Beattie Mr. F H Mills was appointed a Leverhulme scholar for three months. The tenth Macloghlin scholarship was awarded to R. H Gorrill of Torquay Grammar School

The following were elected for the ensuing year :—*Hunterian professors*. Dr S A Henry, cancer of the scrotum in relation to occupation; Mr. C P G Wakeley, treatment of certain types of external hernia, Mr Digby Chamberlain, treatment of stone in the common bile-duct, Mr. Rainsford Mowlem, use and behaviour of cartilage and bone transplants, Mr. Hermon Taylor, clinical evaluation of gastroscopy; Mr E C. B Butler, treatment, complications and late results of acute hæmatogenous osteomyelitis, Mr A H. McIndoe, inlay grafting, Mr. T F. Todd, urological complications of carcinoma of the cervix; Mr D. L Griffiths, Volkmann's ischæmic contracture; Mr F. F Rundle, the pathogenesis of thyrotoxicosis—clinical aspects, Mr. Kenneth Eden, dumb-bell tumours and neurofibromatosis of the spine, and Mr. F H. Mills, pathogenesis of thyrotoxicosis—experimental aspects. *Arris and Gale lecturers* : Dr John Beattie and Mr M W. C Oldfield *Erasmus Wilson demonstrators* Mr Robert Davies-Colley and Dr L W. Proger. *Arnott demonstrator*: Dr. A J. E Cave.

Dr L W Proger was reappointed pathological curator of the museum, Sir Frank Colyer, hon curator of the odontological collection, and Mr. C J. S Thompson, hon curator of the historical collection Prof G Grey Turner was appointed representative of the college on the council of King's College, Newcastle The following were appointed assessors for the primary fellowship examinations to be held abroad next year :—

India—Prof M A H Siddiqi (anatomy) and Lieut.-Colonel H S Anand (physiology)

Egypt—Prof Douglas Derry (anatomy), Prof G Von Anrep (physiology), and Dr Boris Boulgakov (superintendent of dissections)

Diplomas of fellowship were granted to the following :—

J R Dickinson, Camb and Guy's, G H Baines, Camb and St Thomas's, F J Cahill, Melb, F E Stock, King's Coll., and Y M Subhedar, Bombay.

A diploma of membership was granted to P. W W Gifford (Birmingham), and licences in dental surgery to the following .—

J D Anderson, M S Barrada, P G Berger, B A Bharucha, Hubert Brock, A N Butler, I S. Cardell, F A Clements, T N G Copestake, P W Davis, D H Davy, D B Doran, J A. Dosser, J C Douglas, A R M Fakhry, J. C M Flower, R J Gething, I K Gooch, L M Irwin, M R C Kemp, Alan Kinghorn, W B Knapman, B R S Leake, D W Macleod, G A. McMurdo, L D C March, D D Mears, Arnold Mowbray, D C Murray, J M Paterson, R H F Pearce, H R Phillips, T N Praat, Heinz Rawitz, G G G Rees, Howell Rees, J. G Richards, R E Savage, E W Sleeman, H V Spence, M A. Tischler, G M Turner, Emmerich Weindling, and G A M Whittall

The following diplomas were granted jointly with the Royal College of Physicians .—

D P H—L A Collins, E A Hardy, H B Hodson, S B Karani, S A Maclean, Margaret M Meikle, Joseph Moraza, and Kathleen M N Vickers

D P M—Rosie B Becker, F A Bleaden, Neville Copelyn, W A S Falla, S W Gillman, F P Haldane, F D S Hatfield, J A Herd, J H Hurt, H A C Mason, Elizabeth H Rosenberg, C A Rumball, J P Spillane, Joyce M Stephen, G T Stockins, F J E Stuhl, S Le R Switzer, J A Walters, and Fanny D Wride

D L O—O I E De Sousa, T P Hardie Nell, S W G Hargrove, J F Jarvis, F J Kritzinger, L F Lal, K G Rotter, A S Shereen, Jagdish Singh, T P N Sinha

University of Manchester

Dr David Stewart, lecturer in anatomy, has been appointed assistant director of the anatomical laboratory Dr T E. Barlow and Dr Sidney Mottershead have been appointed demonstrators in anatomy

Dr T H B Bedford, Dr William Brockbank, Dr F R Ferguson, Dr P B Mumford, Dr J F Ward, and Dr Raymond Whitehead have been appointed members of the board of the faculty of medicine

Westminster Hospital

The annual dinner of the old students of this hospital will be held on Saturday, Sept 30 at the Trocadero Restaurant, London W 1 Dr Hildred Carlill will be in the chair Lord Burghley, M P, will deliver the inaugural address of the session on Monday, Oct 2, at 3 P M

International Society of Medical Hydrology

The next annual meeting of this society is to be held in Florence and the neighbouring spas from Oct 14 to 19 The members of the congress will be housed in Montecatini for the first four days, and in Salsomaggiore for the fifth, but the opening meeting will be held at Florence Subjects for discussion will be physicochemical studies of the perspiration occurring after treatment by peloids, spa treatment of diabetes, and the action of solar rays on the skin of children Further information may be had from the secretary of the society, 22, Bedford Place, London, W C 1

Crops and the Soil

In the course of an address to the Society of Chemical Industry this week Sir John Russell, F R S, director of the Rothamsted Experimental Station, referred to the effect of manuring on the quality of crops Some people, he said, went so far as to claim that crops grown with inorganic fertilisers were themselves unhealthy, were unwholesome for human beings and for animals, and conduced to disease, whereas crops grown with organic manures remained healthy and health giving "No evidence is offered," he added, "nor do I know of any All available evidence goes to show that the large crops grown with suitable fertiliser mixtures are at least as healthy and as nutritive as any others"

International Neurological Congress

The third International Neurological Congress will be held in Copenhagen from Aug 21 to 25 under the presidency of Prof Viggo Christiansen The main topics for discussion will be the endocrine vegetative system, the heredo familial diseases, and neurological aspects of the vitamin deficiencies Sir Henry Dale, F.R S, will contribute a paper to the first discussion, and Sir Edward Mellanby, F R S, and Dr C C. Ungley will speak in the third discussion

The congress will also meet in various sections, one of which will deal with neurological subjects and one with epilepsy Further information may be had from the secretary of the British national committee, Dr Macdonald Critchley, 137, Harley Street, London, W 1

Imperial Social Hygiene Congress

A dinner for this congress was given on July 13 at the May Fair Hotel, London, by the British Social Hygiene Council Dame Rachel Crowdy, proposing the toast of Health and Education in the Empire, paid tribute to Havelock Ellis, as one of the greatest pioneers of sex hygiene She went on to speak with some misgiving of conditions in the West Indies which she had lately visited as a member of the Royal Commission In some parts, she said, ten or fourteen people are living in rooms measuring only 10 × 12 feet, and there is little teaching and amusement for adolescents The only preventive work she saw in Trinidad concerned the immunisation of bananas at the Tropical School of Agriculture Sir Walter Langdon Brown proposed The Guests and recalled that Dr Gordon Bates, the general director of the Health League of Canada, supervised the film "Damaged Lives" which has now been seen by over 5 million people in this country Dr Bates, in reply, said that social hygiene means essentially an emphasis on the social responsibility that each man and woman in the world has towards every other man and woman He spoke of the need for consistent propaganda through the radio, the newspapers, and otherwise In referring to some of the achievements of the Health League of Canada, he remarked that last year out of 1000 pregnant women successively examined only 3 had a positive Wassermann reaction The conquest of diphtheria, he said, rests entirely on education, the method of prevention exists but is not being used In Toronto in the course of four years the incidence of this disease fell from 1022 cases with 65 deaths to 22 cases and no death This year there had been only 2 cases in Toronto, a city of 800,000 people Compared with this in Great Britain last year there were 62,000 cases of diphtheria "Raw milk," continued Dr Bates, "has caused more deaths than war itself," and yet France, the home of Pasteur, does not pasteurise her milk In Toronto in the first year of pasteurisation the infantile mortality fell by 30 per cent and bone tuberculosis of bovine origin vanished Compared with this in Glasgow one hospital is devoted to the care of this form of bone tuberculosis Dr J M Mackintosh paid tribute to the health work stimulated by Mr L S Amery, as president, notably the inclusion of venereal diseases treatment in Mr Lloyd George's health insurance scheme

Cosmetics

A plea for more serious attention to the medical aspect of the cosmetics industry was made by Mr H Stanley Redgrove addressing the annual meeting of the Society of Chemical Industry at Exeter on July 12 "Unfortunately," he said, "medical men have been too engrossed with combating the ills which cause death to devote attention to those which produce merely ugliness Hence the story of curative cosmetics is largely a story of chicanery" It was difficult for a woman to judge of the merits of a cream whose persistent use, it was claimed, would restore a lost complexion The task was one for the dermatologist "There is, in my opinion, only one satisfactory method of evaluating a cream for which permanent beautifying effects are claimed Of a series of subjects, one half of the face must be treated over a sufficient period with the cream in question, and the other half, for the same period, with a cream identical in composition with the first cream save for the omission of the special ingredient whose action is under investigation It is practically impossible to persuade women to carry out rigorous tests of this character They can be done in hospitals only"

Births, Marriages and Deaths

BIRTHS

DEWSBERY.—On July 9 at the London Clinic, the wife of Dr J P Dewsbery—a daughter

DIVINE.—On July 11, at Singapore General Hospital the wife of Dr T A Divine—a daughter

HALL.—On July 9 at 174 Sutherland Avenue, W 9, to Marcia, wife of Dr Vernon Hall—a daughter

NELSON.—On July 10 at Bournemouth, the wife of Dr Wallace Nelson Gold Coast—a son

MARRIAGES

KEKWICK—PEARCE BROWN.—On July 8, at Holy Trinity, Brompton, Alan Kekwick M B M R C P, to Susan Pearce Brown

MOLESWORTH—MOORE.—On July 15, at St Albans Abbey Brownlow David Molesworth M B to Rosemary Katharine Moore

YOUNG—HOOPS.—On July 4 at St Jude's Church Courtfield Gardens London, Bertram A Young M D M R C.I, to Betty M Hoops

DEATHS

DEWES.—On July 13 at Blackheath Frederick Joseph Dewes M R C S, lieut-colonel I M S (retd), aged 83

DYSHORT.—On July 14, at Camberley Surrey, Donald Frederick Dysnort major, I M S (retd), aged 53

HUNT.—On July 14 Ernest Rivaz Hunt M D Camb, M R C P of 14, Palmeira Avenue, Hove, senior aged 66

MELLANBY.—On July 13 John Mellanby M D Camb, F I S Wycliffe professor of physiology and fellow of Magdalen College

PHILPOT.—On July 11 at 19 Campden Hill Square W 8 Joseph Henry Philpot M D Lond, M R C P in his 89th year

N.B.—A fee of 7s 6d is charged for the announcement of Births Marriages and Deaths

Appointments

ASPIN, D E, M B Glasg, assistant medical officer of health (A R P) for Blackburn
BAILLIE, M HAYDON, M R C S, resident medical officer at the Borough General Hospital, Warrington
CLARK, J M P, M B Leeds, F R C S, medical superintendent at the Marguerite Hepton Memorial Orthopædic Hospital, Thorp Arch, Yorks
CRABB, D R, M B Lond, surgeon to the City of London police force
FORDF, NANCY, M B Manc, junior assistant medical officer at the Wadsley Mental Hospital, near Sheffield
GREEN, H J, M B Aberd, F R.C S E, registrar and obstetrical tutor at the Jessop Hospital for Women, Sheffield
HASLEGRAVE, IRENE, M B Leeds, resident medical officer at the York Dispensary
HEAP, M J McKENZIE, M R C S, resident house-surgeon at Royal Manchester Children's Hospital, Pendlebury
HILL, B. P, M B Manc, D P H, hon assistant anæsthetist to the Royal Berkshire Hospital, Reading
HUDDY, E C H., M B Lond, D P H, assistant medical officer of health for Finchley
HUGHES, EDWARD, M D Lpool, D P H, medical officer of health and port medical officer for Dover
JONES, J D T, M B Durh, junior surgical registrar at the Royal Victoria Infirmary, Newcastle-on-Tyne
LENDRUM, J D, M B Manc, D P H, assistant county tuberculosis officer for Worcestershire and resident medical officer at King Edward VII Memorial Sanatorium, Knightwick
LYLE, J S, M B Edin, F R C S E, resident surgical officer at the Royal Infirmary, Bradford (reappointment)
MURPHY, J M, M B Dubl, D P H, resident assistant medical officer at the City Isolation Hospital, and temporary assistant medical officer for Cardiff
O'GORMAN, F J P, M B Glasg, senior resident officer at the Jessop Hospital for Women, Sheffield
ORTON, ROBERT, M B Leeds, assistant medical officer at Storthes Hall Mental Hospital, Kirkburton, near Huddersfield
OWENS, W E, M B Camb, D A, hon anæsthetist to the Hospital for Women, Soho Square, London
PAYNE, R W, F R C S E, D O M S., hon surgeon to the Royal Eye Infirmary, Plymouth
ROWLANDS, E N, M D Manc, resident medical officer and assistant pathologist at the Royal Infirmary, Bradford
SAXTON, R S, M R C S, assistant medical officer for civil defence for Brighton
WAYTE, A B, M R C S, chief clinical assistant to the X-ray (diagnostic) department of the West London Hospital
WOODHEAD, ALICE L, M D Manc, M R C O G, consulting gynæcologist for Hackney
WYNTER, TAMSIN, M D Lond, D A, hon anæsthetist to the Hospital for Women, Soho Square, London

Charing Cross Hospital, London—The following appointments are announced—
JAMES, K L, M S Lond, F R C S, cancer and radium registrar,
REYNOLDS, S R, L R C P, clinical assistant in the X-ray and electrotherapeutic department; and
BURFORD, H G, B M Oxfd, clinical assistant in the dermatological department

London County Council—The following appointments are announced A M O (I) or (II)=assistant medical officer, class I or class II—
SMELLIE, ELSPETH W, M B Oxfd, A M O (I), White Oak,
LEGGETT, H A, M B Lond, A M O (II), Grove Park;
MCDOWELL, L A, M B Belf, D P H, A M O (II), King George V Sanatorium,
MEAGHER, MARY W, M B N U I, D P H, A M O (II), White Oak,
SHARKEY, JOSEPH, M B Dubl, A M O (II), Archway;
FLETCHER-JONES, H C, M B Lond, A M O (II), Archway,
WYMAN, A L, M B Lond, A M O (II), Archway,
WALSH, J J, L R C P I, D P H, A M O (II), Dulwich,
LEWIS, R I, M D Lond, A M O (II), Paddington,
DAFOE, C S, M D, A M O (II), St Alfege's,
LAWRENCE, J S, M D Edin, A M O (II), St Nicholas';
MILLER, S J H, M B Aberd, A M O (II), St Peter's;
CRAIG, N S, M D Manc, D P H, medical superintendent, St James',
MCCREA, A N, M B Camb, F R C S, senior A M O (II), Highgate and
VERNON, H K, M B Durh, F R C S, senior A M O (II), St Stephen's

Vacancies

For further information refer to the advertisement columns

Belfast Royal Maternity Hosp—Res M O in charge Rea Block (Isolation), at rate of £100 Also two res M O's, each at rate of £52
Belgrave Hosp. for Children, Clapham Road, S W 9—Asst. physician
Benenden, Kent, National Sanatorium.—H.P, at rate of £150.
Birmingham, Dudley Road Hosp—Jun M O, at rate of £200
Birmingham City—Res asst M O, £150
Birmingham City Education Committee—Asst school M.O, £500
Birmingham United Hosp—Asst surgeon to throat and ear dept £50
Blaydon Urban District Council, &c—M O H, £800
Brighton County Borough—Sen. M O. and asst to M.O H., £[illegible]
Bristol University—Asst lectureship in pathology, £300
Burnley County Borough—Asst. M.O, £500
Cambridge, Addenbrooke's Hosp.—H S, at rate of £130.
Cardiff, Isolation Hosp—Asst res M O, £250
Chesterfield and North Derbyshire Royal Hosp—Res surg O, £300
Colchester, Royal Eastern Counties' Institution.—Asst. M O, £35[illegible]
Derbyshire Education Committee—Asst school M O, £500.
Dorchester, Dorset County Hosp—H S, at rate of £150
Dudley, Guest Hosp—Res. surg. O, at rate of £250–£300. Also H S., at rate of £150.
Edinburgh, Princess Margaret Rose Hosp for Crippled Children, Fairmilehead—Sen and jun res surg O's, £200 and £100 respectively
Elizabeth Garrett Anderson Hosp, Euston Road, N W 1—Hon. asst anæsthetist, 10 guineas
Evelina Hosp for Sick Children, Southwark, S.E 1—H.S., at rate of £120
Godalming, Surrey County Sanatorium.—First asst. M.O., £[illegible]
Halifax Royal Infirmary—Cas O for fracture clinic, at rate of £150
Harrogate, Royal Bath Hosp—Res M O., £200.
Henley-on-Thames, Berks and Bucks Joint Sanatorium.—Second res asst. M O., £350
Hull Royal Infirmary.—Second H P. and second cas O., each at rate of £150.
Ilford, King George Hosp—Hon anæsthetist
Ipswich County Borough Sanatorium—Asst M O, £350
Kidderminster and District General Hosp—Sen H S, at rate of £150
Lancaster Royal Infirmary—Cas O and orthopædic H S, at rate of £130
Leeds Jewish Hosp, 9, Leopold Street—Res M O, £200
Lyphook, Hants, King George's Sanatorium for Sailors—Asst M O, at rate of £200
Liverpool Heart Hosp, Oxford Street—H P, at rate of £[illegible] Also clin assts
Liverpool University—Demonstrator in physiology, £300
Maida Vale Hosp for Nervous Diseases, W 9—H P, at rate of £100
Maidstone, West Kent General Hosp—H P and H S, each £[illegible]
Manchester, Ancoats Hosp.—Two H S.'s, one for orthopædics and one for joint post of H S to ear, nose and throat dept., and H P, each at rate of £100
Manchester, Christie Hosp and Holt Radium Institute, Withington—Asst M O, £400 Also res M.O, at rate of £150
Manchester, Royal Children's Hosp, Pendlebury—Res surg O and asst M O for outpatients' dept, each at rate of £150
Manchester, Royal Eye Hosp—Jun H S, £120
Manchester, Saint Mary's Hosp—H S for Whitworth Park Hosp, at rate of £50
Manchester Northern Hosp—Res H P and res H S, each at rate of £100
Manchester Royal Infirmary—Asst surgical officer, £70
Middlesbrough, Poole Joint Sanatorium, Nunthorpe.—Med supt, £900
Ministry of Health.—Medical officers, each £850.
Nelson Hosp, Merton, S W 20—Res H S, at rate of £150
Northampton General Hosp—H S, at rate of £150
Nottingham General Dispensary, Hyson Green Branch—Res M O £300
Oldham County Borough—Temporary asst. M O H., £500.
Penzance, West Cornwall Hosp—H S, at rate of £150
Portsmouth, Saint Mary's Hosp—Jun asst res M O, £[illegible]
Portsmouth Royal Hosp—Cas O, at rate of £130
Preston, Sharoe Green Hosp—Jun asst res M O, at rate of £[illegible]
Queen's Hosp. for Children, Hackney Road, E 2.—H.S and cas O, each at rate of £100.
Reading, Royal Berkshire Hosp—Res anæsthetist, at rate of £250
Royal Army Medical Corps—Vacancies
Royal Free Hosp, Gray's Inn Road, W C 1—Clin asst to gynæcological dept Res cas O, at rate of £150 Also first asst in children's dept, £100
Royal Naval Medical Service—Medical officers
St Mary's Hosp, W 2—Second res anæsthetist, at rate of £[illegible]
Sheffield Royal Infirmary and Hosp—Res H S. to ophthalmic dept., at rate of £80–£120.
Southampton Children's Hosp and Dispensary for Women—Res M.O, at rate of £150
Tavistock Clinic, Malet Place, W C 1—Pædiatrician, £50
University College Hosp, Gower Street, W C 1—Sen asst. radiologist, £250
University of London, King's College, Strand, W C 2—Lecturer in physiology, £350
Wakefield City—Jun asst M O, £500
Walsall General Hosp—Res surg O, £300
Weir Hosp, Weir Road, Balham S W 12—Sen res M O, £[illegible]
West Malling, Kent, Leybourne Grange Colony—Asst res M O, £350
Westminster City—Second temporary asst M O H, £600
Wolverhampton, Royal Hosp—Asst res M O for gynæcological and obstetric dept, at rate of £100
Worcester County and City Mental Hosp, Powick.—Asst M O, £350

The Chief Inspector of Factories announces a vacancy for an examining surgeon at Moffat (Dumfries)

" . One enterprising baby of my acquaintance has already arranged to publish his memoirs in collaboration with a famous psycho-analyst as soon as each of them has learned to write intelligible English "—IRWIN EDMAN in "Philosopher's Holiday," London, 1939

NOTES, COMMENTS, AND ABSTRACTS

THE CULTURAL BACKGROUND OF THE HEALTH EDUCATOR*

BY IAGO GALDSTON, M.D.
DIRECTOR OF THE INFORMATION BUREAU, NEW YORK ACADEMY OF MEDICINE

THE position of the health educator is radically different from that of his associates. His intellectual stance, the working patterns of his mind, are in essentials diametrically opposite to theirs, and properly applied, they serve as correctives.

Who are the co-workers of the health educator? They are those from whom he draws his factual materials, the raw but meaty elements of that which he teaches. They are, to name them singly, the biologist, the physiologist, the pathologist, the medical clinician, the therapeutist, the sanitarian, the vital statistician. (There are also the public health administrators, and the technicians of educational methods and media, but they form a rather different, perhaps secondary, group.) These and many others have one large characteristic in common, which he does not share. They are scientists, whereas the health educator is not. Of course as an individual the scientist may also be an educator, in that he may teach his specialty. The health educator may also be a scientist, or may even attempt to make a science out of his teaching. But this does not affect the basic difference of function. We may say that the health educator and his co-workers look through the opposite ends of the telescope, or, better still, the scientist employs the microscope, the health educator the telescope, the one scrutinises the infinitesimal, the other the universe.

Science has so captivated us that to speak of a professional group as not being composed of scientists almost conveys a stigma. But for my part I intend no derogation of the health educator. On the contrary, I want to dissipate the sense of inferiority that often affects him, and to spare him from aping his at times rather arrogant associates, the scientists, to whom the catch phrase, "Those that can, do, and those that can't, teach," appeals as the quintessence of wisdom.

SCIENCE NOT ENOUGH

There are other functions to be performed besides those of the scientist. One may for example be a philosopher, a person of broad learning, a devotee of *scientia*, of embracive knowledge, intuitionally as well as inductively acquired. At the present time it looks as though the world suffers from a plethora of scientists and a dearth of philosophers. I am certain as to the latter, and the seeming plethora of scientists may only be a reflection of the dearth of philosophers. What does being a scientist imply? It implies first of all the restriction of interest inquiry, and concern to some segment or phase of being, animate or inanimate, individual or universal. It means specialisation, it means isolation and abstraction of that which is dealt with from the rest of existence to which it is related. It means perforce distortion, an attempt at clear definition in terms inherently obscure. It means also the pursuit of a line of endeavour which has yielded powerful means and great knowledge where with to master the environmental world.

I should not be surprised if some took exception to these statements. But I would urge the dissenters to judge science and the scientists by their works. Predominatingly these have been analytical, the large whole has been fragmented, broken into smaller and ever smaller parts, and each part carried further and ever further away from its parent body. Such basically, essentially, unavoidably and desirably are the functions of the scientist, and no one who has any acquaintance with the labours of the bacteriologist, the biochemist, the vital statistician, and the rest of our co-workers will deny this.

Lest some think that in over-compensation for not being of the scientists I gloat in parading their limitations, let me say that I am emphatic only that I may better present the compensating and corrective services which the non-scientific, but I would hope philosophical, health educator must render. The function of the scientist is analytical, that of the health educator is integrative. Perhaps the reason why "all the king's horses, and all the king's men, couldn't put Humpty-Dumpty together again" was because they were all scientists.

The tangent of the scientist's efforts runs to the object of his study, that of the health educator runs ultimately to the individual human being. The scientist may—indeed often must—afford himself the luxury of an uncharted pursuit of his subject, he takes pride in pure science. Not so the health educator, he is functionally committed to practical purposes. He labours for definite ends defined in terms of ever greater human well-being and happiness. The scientist can lock himself up with his rarefied concern, shutting out the to him irrelevant outside world. The health educator must, on the contrary, be ever more embracive in his interest, understanding, and function. The scientist is free to pursue his inquiry wherever it leads him. The health educator is man-bound. The scientist must ask, "is it true?", the health educator in addition must ask "is it pertinent?" The health educator must sift facts and knowledges through the sieve of relevancy to man-kind. For these reasons the scientist need not know what the health educator must.

In contrasting the functions of the scientist and health educator, in setting in opposition their intellectual prerequisites I intend no weighing in balance, and no measuring of merits. I do not know that the one is superior to or more valuable than the other. I do know that they are complementary, and also distinct from each other. I know in addition that many among the scientists look upon the health educator as something of a camp-follower, as a collector of scraps, and a peddler of diluted information. At a more generous level they look upon the health educator as an interpreter or translator of science to the multitude. There are exceptions among the scientists, their number is growing, but withal they are still in the minority. Unfortunately not a few among the health educators share somewhat the same honourless views of their function, and do not fully appreciate the value and importance of their services. Instead of qualifying ever better for their job by cultivating their integrative powers they ape the analytical techniques of their co-workers. They strain at the microscope instead of sweeping the vast horizon with the telescope.

The health educator teaching science instead of well-being, talking to the fact rather than to the man, presents a disheartening picture of energy

* Abridged from an address to the American Public Health Association.

misapplied, of opportunities muffed, and futility and failure eagerly embraced He serves stones to those that ask for life-sustaining bread He mouths a language foreign to those who seek guidance and help He is without a sense of relevancy and has lost his bearings The infertility of much in health education springs from this common confusion as to the rôle and function of the health educator

The health educator is *man-bound*. He cannot afford himself the luxury of pure science. Everything must have reference to man, with the health educator. Every crystallised angular "truth" mined by the scientist must be cut down and polished to fit the peculiar setting, man. Isolated consideration of an established fact is not permissible to the health educator. He must view the fact in its multiple relations, for he is man-bound, and man is a creature of multiple relations. To the scientist the effective cause of syphilis is the spirochæte; to the health educator the spirochæte is only a contributory and at that a secondary cause. To the health educator the prevalence of syphilis depends very largely on dominant motives, on prevailing ideologies, on current objectives in life, if you please, on the prevailing culture in the community. The eradication of syphilis may be sooner effected by a modification of the prevailing culture than by the arsenicals and heavy metals.

In an over-simplified—i.e., scientific—association of ideas it may appear proper and promising to endeavour to stamp out a plague by prohibitive legislation. The non-scientist but philosophic critic, aware of the multiple relations of man, may argue that prohibitive compulsive legislation is seldom effective in attaining the ends sought, and that it always reduces the moral strength of those to whom it is applied.

KNOWLEDGE AND OUTLOOK

The health educator is man-bound: man is his reference point; he must therefore have a comprehensive knowledge of man, of the creature called *Homo sapiens et sentiens*. What does this imply? Some little knowledge of man as a physicochemical mechanism; but a deep knowledge is not essential. The human mechanism is the province of the scientist, who will readily supply the inquiring health educator with the facts desired, which of course must be accepted on faith and in the hope that the scientist really knows whereof he speaks. However, much and deep knowledge the health educator should—indeed must—have of man as a social animal The multiple relations of man are social in origin and nature The health educator confronts man not as a physicochemical mechanism but as a social animal, a creature of the family, and of the community.

Man is a creature with a history—and the knowledge of man as a social animal can be gathered through the keen and critical study of his history. Such knowledge is not to be gained from the standard history-books, most of which are devoted to wars and the exploits of the governing sovereigns and classes It is the cultural history of mankind that the health educator needs to know, beginning at least with the Greeks of the Periclean period.

Man is the builder of an οἶκος, and a maker of tools. A knowledge of the economic and technologic history of mankind is vital to the cultural training of the health educator. Among some groups the economic factor in human existence today overshadows all others and the materialistic interpretation of history is believed to be the only one to afford us a correct understanding of man's motives and actions This is a provincial belief On the other hand, the economic factor in human existence is of tremendous significance, and the lower the subsistence level of the class the greater its operative strength is among them A starving man is of necessity entirely preoccupied with food. The economic factor is a potent catalyst among those of greater fortune, but among them it operates not as a prerequisite to subsistence but as the embodiment of power and prestige. Our much neglected economist and sociologist, Thorstein Veblen, expounded this in his book, "The Theory of the Leisure Class."

The technologic history of man is intimately related to the growth of scientific knowledge, and should be studied in that association The growth of science since the time that Francis Bacon so brilliantly advocated the inductive method of research deserves special study. For gratifying as it is to follow the brilliant and intuitional sorties of Pythagorus, and the more utilitarian works of Archimedes, we *are* the children of modern science. However it is necessary to point out that most students of the history of modern science are too restricted in their survey. It is not enough to know the years of Galileo, of Harvey, or of Descartes, nor yet the particular contributions of Newton, Lavoisier, or Schleiden To these must be added the knowledge of the effects produced by these men and their works on the cultural state of the ages during which they lived. Copernicus did not merely reverse the gyrations of the sun and the earth; he shook the very firmaments, and dethroned man. Laplace did not merely formulate a dynamics of the universe, he deliberately and somewhat contemptuously excluded God from any part in the management of the universe. Darwin created an Aristotelian classification of living things, and advanced a Platonic hypothesis of progression which he termed organic evolution Darwin was guiltless of any rash or raw application of his theory of evolution to those phases of being which transcended his subject matter. But to his followers, numbered in millions, the struggle for existence and natural selection proved compelling ideas which discredited the ethical ideals preached by the Nazarene. Man, however, is not only a thinking creature, but also a spiritual, ethical being The foundation of civilisation is not figuratively the top layer of the human brain, his thinking mechanism, the pallium, but rather the underlying hypothalamus, the feeling centre Man's gregariousness made possible the instrumentalities of learning. Johnny Appleseed who planted so that those who came after him might reap, is symbolic of the best in man. Mutual aid, as Prince Kropotkin taught, and not the ruthless cut-throat competition of the deluded "realists," yielded all that is precious in civilisation. These deepest instincts of man have found expression in his professed ethics, and have been formulated in his religious confessions.

Modern science has taken little cognisance of the spiritual, ethical, and religious aspects of human existence Its measuring instruments have proved unsuited for the analytical study of man spiritual! Unable to grapple with the problem, science has argued away its existence; or being at times compelled by necessity, as when dealing with physiological psychology, to recognise the existence of "hope, faith, and charity," science has brought forth vapid mechanistic theories and equivalents of the soul.

There is, of course, no warrant for demanding that he who labours in search of the secrets, say of the viruses, shall also be competent to answer the riddle

of the human soul It will be well enough, as it seldom is, if the scientist sticks to his job and does not presume with his restricted competence to give judgment on matters outside his ken Unfortunately, the shoemaker does not always stick to his last The health educator must know not only the glories and achievements of modern science, but also its pretentions and limitations The health educator should know not only of the ecclesia's war upon science, but also of science's bitter war upon the ecclesia, which is understandable and to be forgiven, as well as of its war on religion, which may also be understood, but is harder to forgive

Finally, the health educator should not be without a knowledge of the great literature of the human race For otherwise he misses sharing in the most precious heritage of man

* * *

The cultural training of the health educator which I've sketched is not given as a curriculum for the novitiate It is not an absolute prerequisite to service It is a life time task, never to be completed But it is a desideratum, it is an obligation to the fulfilment of which we must devote our best years and energies

NURSES IN INDIA

THE Indian Nursing Statistics for 1937, compiled for the Trained Nurses' Association of India by Prof John Maclean, cover only British India, giving no information about the conditions of nursing in the native states In the 803 hospitals covered, with more than 20 beds each, there are 51,488 beds and 3259 trained and 3517 untrained nurses, as well as 565 male nurses The 1128 hospitals, with less than 20 beds each, have in all 14,195 beds and 743 trained and 53 untrained nurses, as well as 82 male nurses Unfortunately the returns from the different hospitals are made in a great variety of ways, some including male nurses in their totals, and some not doing so, for example. As a result, it is impossible from the figures given to draw any reliable inferences about the number of patients per nurse, the returns under this heading vary from 3 to 1460 The position is further complicated, as nursing help is, in many hospitals, given by relatives Prof Maclean is well aware of the deficits in these statistics, and has added a long list of corrections, together with a list of "entries suspect and requiring comment, if not correction" It is to be hoped that the necessity for more accurate returns will be borne in upon the numerous hospital authorities

On July 14, at a session of the Imperial Social Hygiene Conference, Miss D Hartley, secretary of the association, said that recently, without warning, an order had been issued in Madras cutting down the salaries of nurses by nearly half and stopping their special food allowances Further, in future male patients would be in charge of male nurses only This was affecting the recruitment of the best type of nurses in Madras

TO COUNTERACT ANXIETY

THIS little book [1] is written in a popular manner for the many who are feeling the effects of tension The writer has obviously had much experience of the thorny paths of neurosis, and his advice is drawn from what he has found most valuable in the teachings of the various schools of psychotherapy His division of the causes of acute anxiety into three—separation, guilt, and inferiority—is well conceived, and it may come as a surprise to patients, if not to their doctors, that their symptoms arise not from the political situation but from their own make-up Resentments are fully explained and helpful practical suggestions are made for their sublimation Whether, as seems to be suggested in the first chapter, discipline is sufficient to counter negative methods of thought is open to doubt, and the categorical statement that children cannot stand ridicule needs qualification The chapter which deals with religion and the open mind that welcomes the help it may give should be of value to a generation which represses the religious instinct

1 Fear and Depression Their Causes and Self Treatment. By a Medical Psychologist. Birmingham Cornish Bros 1939 Pp 90 5s.

A PORTRAIT OF REES

THERE are few portraits of George Owen Rees, whose activities as a pioneer in biochemistry were briefly described in our last issue, the British Museum apparently does not possess one A painting was made, however, by S Buck (not to be confused with the famous Samuel, who, with his brother Nathaniel, produced the well-known topographical series of engravings), and from it a mezzotint was made by Sydney Marks A copy, which has until recently been in the family of one of Rees's intimate colleborators, has reached the hands of Messrs Suckling and Co of London It is in perfect condition and bear Rees's autograph in pencil below the engraving "Truly yours, G Owen Rees"

LIMITATION OF OPIUM PRODUCTION

THE proposals of the advisory committee on the traffic in opium, dealing with the limitation of production of raw opium, have now been presented to the council of the League of Nations together with a draft of the articles which might be incorporated in a new convention Subject to certain reservations on behalf of some of the Powers there was general approval of the draft articles and, with some revision, these are to be submitted to the respective governments for their observations Thus Turkey welcomed the proposals, if convinced that the limitations proposed would effectually reduce illicit traffic and that all countries concerned were prepared to cooperate Yugoslavia, another producing country, wanted to be satisfied as to the crops which would replace poppy cultivation, and that the extraction of morphine from poppy stalks and capsules would be forbidden The Canadian representative was not satisfied with the information available in regard to opium production in Manchuria China, Afghanistan and Iran, nor as to the Persian monopoly of prepared opium, while the representative of China, disclaiming any responsibility for what is going on in provinces dominated by Japan, was prepared to achieve suppression of poppy cultivation in the area under Chinese jurisdiction not less rapidly than any other producing country

The principles which underlie the new draft convention are explained as being intended to supplement the provisions of the Hague Opium Convention of 1912 and of the Geneva conventions of 1925 and 1931 Production of raw opium is to be restricted to what is required (1) for medical and scientific purposes, (2) for manufacture of prepared opium pending its suppression and (3) for "other non medical forms of internal consumption" This last is presumably intended to meet the case of opium-eating as officially approved in India The amounts

of world requirements are to be arrived at by annual governmental estimates to be sanctioned and allocated by a controlling authority consisting of five members, the allocation to be either by quota or by a "free order system." Producing countries will undertake not to sow with poppy an area larger than will suffice to yield the allotted amount of raw opium, nor to export more than is assigned to them. Stock will have to be regulated and an adequate system of international control brought into operation.

The advisory committee has wisely requested the council to submit the draft proposals to a committee of jurists in order that they may "be put into proper legal form" and has nominated fifteen governments to appoint such jurists

ALCOHOL IN RELATION TO CRIME

FOLLOWING Dr. Norwood East's opening remarks at the discussion before the Society for the Study of Inebriety (reported on p. 136 of last issue) Dr. J. C. M. Matheson said he could confirm Dr. East's statement about the decrease in the number of female alcoholics received at Holloway Prison The daily average number of persons in custody convicted of drunkenness for the month of March, 1939, was, he said, 24 3 per cent. of the total prison population. I have, he continued, searched the histories of all the women received into Holloway Prison, charged with murder, since September, 1935, for a history of alcoholism with the following results Total number of prisoners received on a charge of murder—48. In no case where a conviction followed was alcohol found to be a factor. In 1 case the prisoner was reported to have frequented public houses with her lover but she was never reported to have been drunk, and the police considered her to have sober habits In 3 cases the habits of the women were irregular, 2 had been living rough, and 1 had been "on the streets," but there was no evidence that alcohol had played any part in the crime with which they were accused. In 1 case alcohol appeared to play a direct part. The victim was killed in a drunken brawl; at the trial the prosecution offered no evidence against the female accused, and she was found "not guilty."

RESERVES AND SUPPLIES OF FOOD

THE *British Medical Journal* last week offered suggestions for the home storage of food against a shortage in emergency. The British Medical Association (Tavistock Square, London, W.C.1) has issued these suggestions in a 2*d* booklet entitled "How to Stock Your A R.P. Larder." It shows the householder how best to act on the Government's advice that all who can do so should lay in a week's store of victuals

The larger question of supplies and storage are considered in "The Food Problem" by F. Le Gros Clark and R. M. Titmuss, issued in the Penguin series at 6*d*. This book will do a public service if it wakes the reader into a realisation of the need for organising the food-supply of this country not only for war but for peace. Mr Le Gros Clark discusses the relation of war and scarcity, the effect of blockade, home-farming and war, storage of food, the dispersal of stores and the future of the food trades. His conclusion is that sources of food and fuel are the weakest links in our chain of defence and that nothing but a sound policy of food storage, and control of such stores and policy by a representative food council, will make that link strong. The second portion of the book is concerned with stamina; and for this portion the two authors are jointly responsible. In spite of all the wastage of human life they see in our present organisation of society and the needless deterioration of stamina through insufficient and wrong food they conclude that "there is no basis whatsoever for pessimism or despair." They believe that with a sound food policy "we could be rearing a stock that would surprise the world by its vitality. So slight and so significant is the borderline between normal and subnormal humanity."

BLOOD-TRANSFUSION IN INFANCY

AN analysis has been made by E. Garcia Pérez of 4500 blood-transfusions given in three and a half years to children in the Hospital Municipal de Infancia, Havana (*Arch. Med. infant.* April–June, 1939, p. 106). That the tender age of a child is considered no bar to such treatment is shown by the fact that 107 transfusions were given to infants aged 1–30 days, 2183 to infants aged 1–12 months, and 1033 to those aged 1–2 years, making a total of 3323 to infants aged two years or less, as against only 1177 to older children up to twelve years. The remedy seems to be widely applied: toxæmia and convulsions were the indications for 2013 transfusions, and 176 were given for bronchopneumonia. The results in bronchopneumonia (acute non-tuberculous disease of the lung) are detailed by Agustin Castellanos and René Montero (*Ibid*, p. 116), who used 150–250 c.cm. of blood, obtained usually from a parent. No anticoagulant was employed, and the veins chosen were either the internal saphenous, external jugular, or antecubital. No reaction was observed and no accident happened. In the great majority of cases the fever, dyspnœa, and general symptoms abated. Cardiac insufficiency was not regarded as a contra-indication, but in its presence the preliminary withdrawal of a quantity of blood equal to that about to be injected is recommended.

In an analysis of 129 cases of infantile diarrhœa in infants aged two years or less, of whom 98 were given blood-transfusions, Cardelle Penichet, Hernández and Durán Castillo (*Ibid*, p. 138) report a case-mortality of 49 per cent. in those transfused and 42 per cent. in the others; but, in spite of these figures, they believe that *early* transfusion lowers the fatality. On the other hand, J. M. Smellie has pointed out (*Lancet*, 1938, 1, 1029) that these infants as a rule are not deficient in either erythrocytes or hæmoglobin, and holds that blood-transfusion is definitely undesirable except in those few who are proved to be anæmic Otherwise the addition to the total of erythrocytes merely throws an extra strain on the child. The need of transfusion to counter toxæmia has led to the giving of transfusions of blood-plasma alone.

A HUNDRED YEARS IN THE NURSERY.—Few remedies can have kept their place in the family medicine cupboard as firmly as Dinneford's Fluid Magnesia, which has lately celebrated its centenary. Its gentleness and palatability appealed to our forbears in their young days, and they appeal no less to our own children.

Medical Diary

July 24 to July 29

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W 12

WEDNESDAY.—NOON, clinical and pathological conference (medical) 3 P.M., clinical and pathological conference (surgical)

THURSDAY.—2.15 P.M., Dr Duncan White radiological demonstration

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology)

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W.C.1

THURSDAY.—2 P.M., Dr W. W. Payne: The Uses of Oxygen in a Children's Hospital

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W 9

THURSDAY.—3 P.M., Dr Russell Brain: clinical demonstration

EDINBURGH ROYAL INFIRMARY

THURSDAY.—5 P.M., Lieut.-Colonel A. G. McKendrick: The Dynamics of Crowd Infections (Honyman Gillespie lecture)

ADDRESSES AND ORIGINAL ARTICLES

FORTY YEARS OF PRACTICE

A RETROSPECT*

BY THOMAS FRASER, C.B.E., M.B., D.L.
CONSULTING PHYSICIAN TO ABERDEEN ROYAL INFIRMARY

IN pre-war days the most striking results from research in medicine were produced by brilliant individuals working with scant assistance, little money, and very limited time for nearly all had as their main jobs university teaching and/or honorary hospital appointments They invented their own apparatus and in many cases made it Of this class in our own University of Aberdeen were Ogston (whose mantle as president of the association, when it last met here in 1914, weighs heavily on my shoulders tonight), the discoverer, in the days of Lister, of the *Staphylococcus aureus*, which he used to describe in his quaint way as a "kindly little creature" compared with the virulent streptococcus, MacWilliam, the physiologist, whose classical work on cardiac muscle provided the foundation on which the brilliant clinical work of Mackenzie and Wenckebach was built, Hamilton, a great pioneer in pathology and bacteriology and a brilliant lecturer, Cash, pharmacologist of aconitine and arrow poisons

All were enthusiastic and able teachers of my student days and stimulators of capable youth to follow in their steps I shall mention only a few of those that readily occur to me in surgery Greig Smith, Scott Riddell, Marnoch, and Henry Gray, in physiology and biochemistry Leslie Mackenzie, Macleod (the initiator and head of the team which so brilliantly solved the insulin problem), Hugh MacLean, and Lawrence, in pathology and bacteriology Bulloch, Dean, and Ledingham, in pharmacology Cushny and Dilling

The output was small in those days as compared with the present, but the quality was usually very high Similar work was being done in such circumstances in many of the medical schools of the country In the post-war period both patient and practitioner alike—on many occasions simultaneously informed—are on many occasions simultaneously informed—of the most recent through the press, shall we say ?—of the most recent discovery, which is a source of embarrassment to the practitioner if he does not recognise that the latest knowledge is not always the latest truth In this period came a greater recognition by the state of the value of research, with a consequent outpouring of money on its behalf, and large sums were given by individuals to endow research and provide fellowships to support brilliant graduates for longer periods than was possible before

Research is no longer an individual affair as a rule, teamwork now prevails, and elaborate equipment, suitable accommodation, and skilled assistance are provided The output has increased and there is earlier publication of results, which has been one of the factors in increasing the number of specialists who can sift the facts of research and assess their applicability to the practice of medicine, and advise and instruct the general practitioner who calls for their assistance in his difficulties No doubt increased output and earlier publication have necessarily lowered the average of quality, but classical quality is still present—for example, insulin and probably the sulphonamide group

The British Medical Association's committee on nutrition has given much useful knowledge to practitioners and the public The pre-war practitioner can recognise the great improvement in the variety of food, and there is no doubt that nutrition has been in the limelight in post-war years, with considerable benefit as a result There is still lacking, however, in an important section of the population, a practical knowledge of food values and possibly a real knowledge of and interest in cooking This leads to a diminution in nutritive and reparative value and to the use of canned or bottled foods in increasing amount, even where fresh food is available at cheaper or at least more economic rates from the point of view of health and sustenance

* * *

There have recently appeared in our local press reports on the condition of the teeth of school children in country districts One education committee stated that less than a tenth of its school children had perfect teeth, and the only remedy suggested was the appointment of additional dentists In October, 1914, I took part in the examination of a county battalion of territorials from the same area, under immediate orders for France My colleagues and I noted that about 70 per cent of the men had excellent teeth, a finding which reveals a sad deterioration, in a quarter of a century, in a most important factor in healthy nutrition Yet there seems to be no need to despair, for I feel sure that the pre-war doctor, from his post-war experience, will agree that there has been great improvement in general health and that it is steadily progressive, with increasing momentum

This opinion is supported by the present Minister of Health, replying to a debate in the House last March, when he spoke as follows

"A great deal of action has been taken on the newer knowledge of nutrition, and there is a marked improvement in the health of the nation. This country consumes a large quantity of dairy produce If butter and cheese were counted as the equivalent of milk, the consumption of milk per head in this country has risen from 73 gallons in the five-year period 1925–29 to 89 gallons for the period 1930–34 This figure is higher than that in Italy, Germany, Belgium, France, and the U.S.A Butter, however, cannot be counted as simply the equivalent of milk; it ranks higher as one of the protective foods While poverty is a factor in the problem of nutrition it is also true to say that wages have risen and the cost of food has fallen"

He compared figures for 1927 and March, 1939, to show the improvements in the nutrition of the nation In 1927 the death rate due to infantile mortality was 70, maternal mortality 4·11, puerperal sepsis 1·57, and tuberculosis 79 Today the death rate due to infantile mortality is 55, maternal mortality 3·26, puerperal sepsis 0·98, and tuberculosis 56 Had he been speaking on the same subject today he would have been able to introduce rather telling support to the above argument from the reports of medical boards on the health and physique of the many thousands of militia in their twenty-first year recently called up for training One is ignorant whether and to what extent the standards previously applied to recruits for admission to the Regular Army have been modified, but even so, the published reports so far point to a great improvement in health and physique

Speaking in a debate on malnutrition in the House of Lords, Lord Hankey—who for nearly a generation,

* Abridged from the presidential address to the British Medical Association at Aberdeen on July 25.

as Sir Maurice Hankey, was secretary of the Committee of Imperial Defence—remarked that when he held that position he was profoundly shocked and humiliated by the fact that more than half the men offering themselves as recruits for the Army were rejected for physical and medical reasons He had been assured that the defects which caused the rejections were curable by proper nutrition, but that it took fifteen years to translate research into action. While public health had improved, much remained to be done. In the schools little was taught about nutrition, and what was taught was mostly out of date With the weight of the Government behind it there should be a sustained campaign or propaganda on the subject. One must keep in mind that the range of choice of recruits is now the widest possible socially, whereas in the days Lord Hankey refers to, apart from the war years, that range was very narrow. Indeed, in a considerable number of cases the stimulus to join the Army was often *faute de mieux*.

* * *

Food is not the only factor, though the most important, improved housing (including workshops), better sanitation; higher wages; shorter hours of work, giving more leisure, which is gradually being better spent; and greater opportunities for leading an open-air life—all are having their effect on the general health of the people To all this must be added the completely changed daily outlook of the industrial population, a considerable part of which in pre-war days, when unemployed from any cause, soon reached a state of threatening semi-starvation This change of outlook is due to workmen's compensation for accident, national health insurance, unemployment benefit, and other factors, all of which have had effects on our daily work as medical men.

The decline of emigration from this country is not entirely due to lack of opportunity to enter other countries; it results partly from a definite and widespread recognition of the opportunities offered here for a free and happy life despite the restrictions now being imposed by law and multiplied by the regulations, based on that law, which our bureaucracy determines. As supporting this opinion, one might point to the considerable number of men (and families) who returned to this country during the great slump of 1930 and following years, frankly recognising that life would be more tolerable here than in the United States and in parts of our Empire overseas under the prevailing conditions. Does the same view influence in some degree the gradually increasing number of distinguished oversea medical graduates who come to this country and often obtain high appointments? That we welcome them is evidence of our friendliness and hospitality, a matter which we trust will continue to be fully reciprocated in all parts of the Empire The Englishman—I omit the Scot on this occasion—has an astonishing sense of fair play, but to the observer he sometimes carries this to such a pitch that he ends by being unfair to himself, with somewhat disappointing results from the point of view of equity

* * *

In pre-war days it was by no means easy in these parts for the practitioner to persuade patients to enter our hospitals for observation and treatment This was greatly changed immediately after the war, and nearly all our hospitals have waiting-lists of such size as to be a menace to rapid improvement in health and restoration to full fitness of many on those lists. This menace is perhaps more apparent than real, for many of those waiting suffer from disabilities which do not interfere to a great extent with capacity for work, nor are they progressive. What was the increased attraction of the hospital due to? There was undoubtedly a great outpouring of war-accumulated wealth on charitable purposes, and voluntary hospitals benefited early and greatly from this, and as a result improved in their equipment and administration This, however, was a matter which took time to develop, whereas the snowball of influx to the wards and the outpatient department started almost immediately after the war, when beds were freed of men wounded or ill from troubles contracted on service. Being in general practice and also on the staff of the Royal Infirmary here, both before and after the war, I had an opportunity of observing this change from a somewhat unusual point of view, at least in a teaching hospital. I concluded that one of the most important factors in the early and rapid rise in the number of applicants for hospital treatment was the fact that enormous numbers of men and women who under peace-time conditions would have been treated in their homes were during the war treated in hospital. A good many millions were removed from their homes on war service, both at home and abroad When they were wounded or ill, attendance and treatment were a matter of concern to the state and to employers, because their speedy restoration to health seemed more important than ever before, and controlled treatment, such as can best be provided in hospital, became the rule. On the return of these patients to civil life these benefits were not forgotten, and it was apparent that the treatment that could be provided in their homes for certain maladies was unfavourable compared with what they had received during the war for similar types of illness; so not only was there a much readier acceptance of hospital treatment when recommended but also it was very often asked for when there was no real need. This was one of the earliest factors to remove from the minds of many the curious idea that the hospital was a place in which to die rather than to recover.

* * *

All this led to a clamant need for the extension of hospital accommodation. In Aberdeen it was recognised early after the war; but many difficulties had to be overcome before our hospitals reached the capacity they now have The idea of our joint hospital scheme originated in the brain of the late Prof. Matthew Hay, medical officer of health for the city, and was first declared in our Medico-Chirurgical Society (which this year celebrates the 150th anniversary of its foundation) in the year of the presidentship of the late Sir Ashley Mackintosh, an ardent supporter of the scheme A committee was formed with the medical officer of health as an active and inspiring member The first check came when Professor Hay's successor as M.O.H declined the committee's invitation to join them. It was decided that to ensure success in the raising of the money it was essential that the leading citizen, the Lord Provost, should take a prime interest in the scheme. In the face of lukewarmness, to say the least of it, on the part of the public-health committee of the town council, and owing to the fact that provosts reign for at least three years, it was not until 1927 that Mr (now Sir) Andrew Lewis agreed in the second year of his office to raise the necessary funds, provided that the scheme had the hearty support of the medical profession Sir Andrew no doubt acted on his knowledge of the corporation's intention to convert the

poor law hospital into a large municipal general hospital

Two meetings of the Medico Chirurgical Society were held, at both of which I was accidentally in the chair The first took place in a somewhat electric atmosphere, in which much prolonged and contentious argument ensued revealing more opposition to the scheme than had been expected The debate lasted almost to midnight, when the meeting was adjourned for a fortnight and then resumed in a calmer atmosphere The tempers had by then cooled, and the vote in favour of the scheme was such that Sir Andrew at once took it up With uncommon wizardry, in two years he collected over £400,000, a very large proportion being raised from the area which the hospital serves and which has a population of about 300,000—a fine achievement Two future kings were associated with the undertaking King Edward VIII, when Prince of Wales, laid the foundation stone in 1923 and our present King, as Duke of York, opened the hospital in 1936 As the hospital neared completion it was found that £100,000 more would be required to free the building fund from debt, and again it was fortunate that the stern occasion produced the man Lord Provost Watt undertook what was recognised as a very difficult task after the way in which the area had already been drained Such were his energy and enthusiasm that in one year he found the money, and his is one of the names which should be placed high in the infirmary's roll of service

* * *

This year the British Medical Association holds its 107th annual meeting The number alone indicates persistent continuity in time, and those who know its history recognise a continuity in purpose and in progressive achievement—a tribute to the vision of those provincial men in Worcester who founded this association in 1832 It is now holding its annual meeting for the second time in this historic city, at its highest peak not only in membership but in influence with the community and the state, its area Empire-wide, and its public spirit second to that of no other similar body In 1914, when the meeting was last held here, its membership was about 22,000, now it is 38,000 A considerable part of my leisure during forty one years of practice has been occupied in the work of the association, and it has been a great privilege and an honour to serve it in various capacities during that time It is true that the quality of that service has varied owing to the restrictions which irregular demands on his time impose on the general practitioner, particularly if in charge of medical wards and engaged in clinical teaching, but the service has always been interested, making the advancement of the association its chief aim

* * *

Those who practised medicine at the beginning of this century had few evidences of state control such as exists now Death, lunacy, and vaccination certificates were a state matter, and, later, notification of certain infectious diseases, for which nominal fees were paid, was a municipal matter, but these were the main contacts of the practitioner with the state and the municipality at that time No striking change came until that stormy petrel of politics, Mr Lloyd George, then chancellor of the exchequer, appeared on the medical horizon with his national health insurance proposals and the profession saw itself threatened with a form of control entirely foreign to all its traditions In the days before the National Health Insurance Act the usual method of starting practice in Aberdeen was to put up a plate and wait for patients To the young practitioner election as medical officer of a society was a boon, it gave him work on which to build up a reputation and enlarge his experience The disadvantages, however, were many, among them undignified competition for such posts and no security of tenure The proposed act removed many of these disadvantages but promised others of unknown effect

* * *

In 1931 another event occurred in which the altruism of the profession in regard to state and community was again to be demonstrated, and on this occasion it did not fail to impress the Government of the day This was the attitude of panel practitioners to the proposed salary cuts at the time of the great slump To the extent of their panel fees panel practitioners were to be considered Government servants These fees were not salary in the ordinary sense but capitation fees which included all out-of-pocket expenses incurred in attending panel patients Headquarters were assured by the then Minister of Health that the Cabinet had decided that a 10 per cent cut on all salaries paid by the state was to be made, and that this cut would be imposed centrally The British Medical Association through its Insurance Acts Committee held a conference in London of panel practitioners, members and non members alike, representative of all parts of the country, and after a prolonged debate it was decided, with few dissentients, to accept the proposed course on the assurance given Parliament, however, did not accept the Cabinet's recommendation The amount of the cut was not fixed at 10 per cent all round nor was it to be imposed centrally in all cases In many it was left to local authorities to decide the amount of the cut, and in this town some escaped altogether, others had 2½, 5, and 7½ per cent deducted, on a few only was the 10 per cent imposed All panel doctors, however, bore a deduction of 10 per cent from their fees for attendance on insured patients, and it was imposed centrally Though there was much argument and much conferring with the Ministry of Health, it was ultimately accepted as a contribution to the National Exchequer in a time of emergency

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From its foundation in 1832 the British Medical Association has been chiefly concerned with (1) the maintenance of the professional standard of education and conduct (both pre and post graduate), (2) promotion of scientific research, (3) promotion of a national public health policy which will allow the profession to make its maximal contribution to the well-being of the country, and (4) improvement of efficiency in all branches of medical practice at home and abroad Its work and attainment since 1925 show it to be an increasingly effective force in the promotion of the common health, not only in this country but overseas as well The first Medical Act of 1858 was based upon a bill drafted by the association, and therefore the association can claim to have been largely instrumental in establishing the General Medical Council

Promotion of scientific research was instituted in 1900, when there was great need of assistance in this regard on account of lack of funds for medical research both in universities and in hospitals Committees have submitted reports on matters connected with the

promotion of health, and many of these have been taken up by the Government and incorporated in acts of Parliament, such as the Medical Inspection of School-children Act A similar report was issued in 1909 regarding ophthalmia neonatorum, and compulsory notification was strongly urged in that report This was adopted by the Government in 1914 A long list of similar events could readily be given, but I will mention only one, which was possibly unique because the association on that occasion was asked by the Government to present a report on physical education Our great association, with its Empire-wide connexions and influence, has in the past played a notable part in the promotion of health, and one feels confident that so long as it continues to attract to its council men of knowledge, public spirit, wisdom, and vision, its accomplishment in that direction in the future will transcend all its past achievement.

ACUTE HYPERPARATHYROIDISM

By W A Oliver, M D Lond, M R C.P.
SENIOR DEMONSTRATOR OF MORBID ANATOMY AND HISTOLOGY AT ST BARTHOLOMEW'S HOSPITAL, LONDON

The possibility that the findings in dogs subjected to an experimental overdosage of parathyroid hormone might be reproduced in man has been recognised for some time, but only three cases, of which one alone was fully proven, have been published.

Dawson and Struthers (1923) describe the case of a man, aged 49, with a long history of the typical bone lesions of hyperparathyroidism with multiple fractures, who, while under observation, had an acute syncopal attack and was admitted with collapse and a rapid feeble pulse to hospital where he died soon after admission. Autopsy showed a parathyroid tumour and extensive generalised calcification in the vessels, heart, lungs, stomach, kidneys, spleen, and liver.

Lowenburg and Ginsburg (1932) describe the case of a boy, aged 5, who, in error, received 100 units of parathyroid hormone daily for six days; on the second day of this treatment he began to vomit and became listless; by the fourth day mental depression had become extreme, he did not respond to even strong stimuli, and high irregular fever with tachycardia was present.

On the sixth day the error was discovered and a blood examination showed serum calcium 19 6 mg. and phosphorus 4·4 mg. per 100 c.cm. When the administration of parathyroid hormone was stopped, the blood chemistry and the clinical condition rapidly returned to normal.

The only case which has been fully proven is that described by Hanes (1939). A woman, aged 49, who had previously been in hospital with pyelitis, was admitted because of increasing weakness, pain in the chest, and much loss of weight. Previously a radiogram of her kidney had shown diffuse fine mottling, examination of the serum calcium had given a figure of 12 mg. per 100 c.cm., and renal function tests had shown considerable impairment.

On examination at her last admission, five years later, a tumour was palpated at the lower pole of the thyroid, radiography showed decalcification of the bones and what was now recognised as the changes typical of metastatic calcification in the kidneys Blood examination showed calcium 20 rising to 22 mg per 100 c cm, phosphorus 4 7 mg. per 100 c.cm., phosphatase 23 Bodansky units, and non-protein nitrogen 58 mg. per 100 c cm. Renal function tests showed severe impairment

While awaiting operation, the patient became increasingly weak and mentally depressed, developed fever and tachycardia, complained of generalised aching pains, and died before operation could be carried out.

Post-mortem examination showed a necrotic and partially calcified parathyroid tumour, composed of chief cells, and diffuse visceral and vascular calcification. The lesions in the kidney, though widespread, were considered to be insufficient to cause death

In view of the apparent rarity of this important and curable condition, the following two cases are placed on record

CASE-RECORDS

Case 1.—A woman, aged 57, was admitted to hospital on Jan 3, 1939, complaining of nausea and retching, loss of weight, weakness, and drowsiness Her drowsy condition made it difficult to obtain her history, and it was necessary to obtain all details from a relation.

For six months she had complained of increasing loss of strength and had lost 1 st. in weight; for two weeks there had been almost complete anorexia with much nausea and retching on any attempt to take solid food; constipation was obstinate, there was no hiccough; and during the two days before her admission she had become progressively more drowsy and unable to keep her eyes open.

Her past history showed that constipation had increased recently, and that she had had occasional attacks of dyspnœa and œdema of the ankles, her memory and mentality had remained normal up to the time of her present illness, there was no past history of renal disease; and she had not taken any depressant drugs.

On examination she was very drowsy but could just be roused. Her temperature was 97° F., pulse-rate 88, and respiration-rate 15. The central nervous system was normal, apart from increased briskness of the reflexes on the right side. The tongue was dry and brown The lungs were normal, apart from emphysema. The heart was not enlarged, the pulse was regular, and the blood-pressure was 160/100. The left kidney was palpable and tender.

Examination of two different catheter specimens of urine showed specific gravities of 1 010 and 1 005 albumin, occasional red blood-cells and granular casts, and numerous white blood-cells and hyaline casts. The urine was sterile on culture The daily excretion of urine averaged 1000 c cm, with an average intake of 1400 c.cm. until she became incontinent, making accurate measurement impossible.

Lumbar puncture yielded a normal cerebrospinal fluid, apart from a raised chloride content of 800 mg. per 100 c.cm. Two estimations of the blood-urea, two days and eight days after admission, showed respectively 76 and 136 mg per 100 c cm., the alkali reserve on the latter occasion being 75 8 c cm of CO_2 per 100 c cm. of plasma.

Progress —The patient became increasingly stuporose, with a progressive fall in blood-pressure to a final reading of 70/50 on the day before death. The tongue and skin remained very dry; there was a terminal rise of temperature, pulse-rate, and respiration-rate; and the patient died nine days after admission without ever developing any localising physical signs.

Post-mortem findings —Brain: a small meningioma was found in the right anterior fossa. Parathyroids: beneath the right inferior lobe of the thyroid was a brownish-yellow tumour measuring 3 8 by 1 8 cm. in its longest diameters and weighing 3·8 g. (fig. 1). Heart: muscle soft and fatty, otherwise macroscopically normal. Kidneys: cut surface showed numerous small calcareous flecks, but no other macroscopic change Bones: no evidence of decalcification or cyst formation. The remaining organs were macroscopically normal. The blood calcium was 17 4 mg. per 100 c.cm and the urea in the cerebrospinal fluid 110 mg per 100 c cm

Histology. — *Parathyroid tumour*; chief-cell adenoma, no oxyphil cells present. Heart: wide-

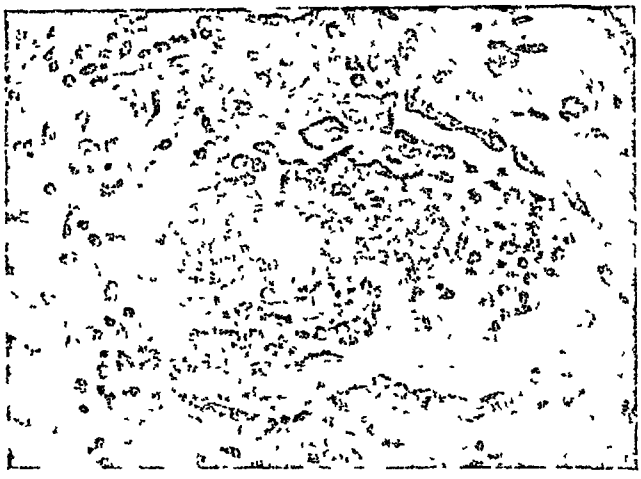

FIG. 3—A glomerulus in case 2, showing necrosis, deposition of calcium, and foreign-body giant-cell reaction (× 340)

and the vessels Thyroid · no deposition of calcium Voluntary muscle. no evidence of medial hypertrophy in the vessels. Spleen and liver: normal, apart from some hyaline thickening of the intima of the vessels, especially in the spleen, and excessive deposition of calcium in the internal elastic lamina

Summary of post-mortem findings.—Chief-cell adenoma of the left inferior parathyroid, with widespread necrosis and deposition of calcium in kidneys, lung, heart, and stomach, and in the vessels in nearly all the organs.

DISCUSSION

Cause of death.—In the absence of more complete investigations, omitted because the diagnosis was not suspected before autopsy, it may be argued that there is no clear evidence that death was due to acute hyperparathyroidism. However, review of the post-mortem findings, both macroscopic and microscopic, shows that, apart from the parathyroid adenomata and the necrosis with associated deposition of calcium, the organs were essentially normal, and that nowhere else was there any lesion sufficient to cause death As positive evidence, there may be adduced the facts that there was in each case a parathyroid adenoma, with the well-recognised pathological syndrome of widespread deposition of calcium and a very high value for the serum calcium (as a control, ten post-mortem estimations of serum calcium, taken at random both as regards age and time after death, have given essentially normal results) In case 1 none of the organs showed sufficient pathological change to cause death as a result of failure in function of that organ alone, the changes in kidney and heart, though widespread, were not severe and do not appear to have affected in any way their functional capacity

In case 2 fairly severe lesions were found in the kidney, and, in view of the raised blood-urea during life, it cannot be stated dogmatically that uræmia was not the immediate cause of death. The clinical features, however, did not closely resemble those of uræmia, for there were no neurological manifestations, no hiccough, no diarrhœa no evidence of acidosis, and no œdema; the blood-pressure was not raised, there was no cardiac enlargement and no severe degree of anæmia, the urea in the cerebrospinal fluid post mortem was only 60 mg. per 100 c.cm (the rather high figure of 176 mg. found in life was possibly due mainly to the severe dehydration after vomiting) The lesions in the heart, although widespread, did not appear sufficient to cause death. It therefore seems reasonable to suppose that death was due directly to the results of an acute hyperparathyroidism

Various theories as to the exact mechanism of death, both in the experimental overdosage with parathyroid hormone and in the human cases reported, have been postulated. Hueper (1937) has suggested that symptoms are caused in experimental animals by an exaggeration of the normal physiological tonic effect of parathyroid hormone, death being due to cessation of the heart in systole. Hanes (1939) considered that death had resulted in his case either from myocardial failure, due to the severe myocardial lesions, or that it had been a "chemical" phenomenon, lack of diffusible phosphorus in the presence of a very high serum calcium being the explanation. The exact mechanism of this latter hypothesis was not discussed Recent experiments of Shelling et al (1938) have again suggested a chemical mechanism, they postulate that the parathyroid may play a considerable part in the distribution of water and electrolytes, other than calcium and phosphorus, and that death, in their animals, after an overdose of parathyroid hormone was due to the loss from the body of fluid and electrolytes; he was able to prevent symptoms by continuous supply of fluids and electrolytes In the cases under discussion it is certain that death was not due to the kidney lesion, there being large numbers of normally functioning glomeruli still present in both cases The severity of the cardiac lesions in case 2 and the tachycardia out of proportion to the fever in both cases support Hanes's view, but the minimal histological changes found in the myocardium in case 1, who died an exactly similar death, appear to negative that suggestion What part dehydration and loss of electrolytes played in these cases it is impossible to say on account of inadequate investigation, but a combination of this factor with failure of the brain to utilise glucose in the absence of diffusible phosphorus is at least a possible explanation of the gradual

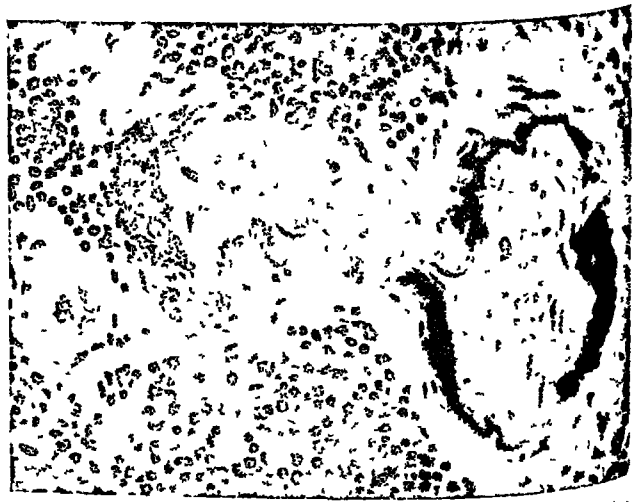

FIG 4—Interlobular vessels in the kidney of case 2 Hyaline thickening of the intima and deposition of calcium in the internal elastic lamina can be seen (× 325.)

onset of coma—i.e., death in each case was "biochemical"

Symptoms.—The similarity between the clinical features of the two cases is very marked. Symptoms were present for an approximately similar time before admission, and the prominent symptoms were repeated nausea and vomiting, anorexia, much loss of weight, obstinate constipation, and, terminally, rapidly increasing drowsiness. In both cases examination showed severe dehydration, an irregular pyrexia with tachycardia out of proportion to the slight fever, no cardiac enlargement, a low blood pressure, and no other significant physical signs. Laboratory examination in each case showed a slight hypochromic anæmia and evidence of renal damage but no significant change in the alkali reserve. The terminal course in each case was similar, with rapidly increasing stupor and a progressively failing blood pressure (final readings: case 1, 70/80; case 2, 104/86).

SYMPTOMS OF ACUTE HYPERPARATHYROIDISM

Case	Vomiting and anorexia	Loss of weight	Asthenia	Constipation	Mental retardation	Pain in the chest
Case 1	+ +	+ +	+ +	+	+ +	−
Case 2	+ +	+ +	+	+ +	+ +	+ +
Lowenburg and Ginsburg (1932)	+ +	No rec.	+	No rec.	+ +	−
Hanes (1939)	No rec.	+ +	+		+	+

rec. = record.

A comparison with the clinical features and findings of two of the previously reported cases (Lowenburg and Ginsburg 1932, Hanes 1939) shows many points of similarity (see table). In none of the cases was there clinical evidence of hypertension, though all the three proven cases showed definite evidence of impaired renal function.

The case reported by Schrumpf and Harbitz (1937), although post mortem proof is lacking, appears to have exhibited very similar though less severe clinical features.

A man, aged 54, complained of lassitude, pain in the back and legs, weakness, and disorientation. Examination showed typical mottling of the kidneys, a tumour in the neck, absence of decalcification of bones, impaired renal function, and a serum calcium of 20 mg. per 100 c.cm. At operation two parathyroid chief cell adenomata were removed, with consequent complete relief of symptoms, although evidence of impaired renal function persisted.

Albright, Aub, and Bauer (1934) consider the symptoms (hypotonia, lassitude, constipation, and loss of appetite with resulting loss of weight) as being typical of hyperparathyroidism but postulate hypertypical of hyperparathyroidism but postulate hypercalcæmia as the immediate cause. It thus appears that the symptoms associated with an increase of circulating parathyroid hormone constitute a fairly well defined syndrome, and that, if a patient exhibiting these general symptoms becomes drowsy and develops fever and a tachycardia out of proportion to the fever, the immediate prognosis is serious.

The symptoms in experimental overdosage of parathyroid hormone in dogs, although not strictly comparable, are in many ways strikingly similar. Collip (1926), Hueper (1927), and Cantarow et al. (1938) report weakness, vomiting, anorexia, and rapidly increasing mental depression, with death in coma, as being typical of the experimental syndrome.

Morbid anatomy.—The exact significance of the pathological changes found in the two cases is difficult to assess, because it was not possible to fix the organs immediately after death, it is, however, clear that the morbid changes in each case are widespread and essentially similar. In case 2 the lesions in general are much more severe than in case 1.

The finding of parathyroid tumours, composed of chief cells only, indicates a definite adenoma secreting parathyroid hormone, as distinct from the general hyperplasia of the parathyroids, seen so often in chronic renal disease or the large oxyphil adenomata which may be found without any symptoms or change in the serum calcium (Hadfield and Rogers 1932).

Glomerular necrosis with only minimal deposition of calcium suggests that the necrosis may have been the primary change, providing a particularly suitable soil for secondary deposition of calcium. Post-mortem degeneration made tubular necrosis difficult to assess, but calcification in the tubular epithelium did not occur without necrosis. Hypercalcæmia alone, as seen in experimental hypervitaminosis D, produces calcified lesions in the kidney which are quite different, large amounts of calcium blocking the normal tubules, the glomerular changes being minimal, and considerable amounts of calcium being deposited in the interstitial tissue. The tubular lesions somewhat resemble those due to poisoning with corrosive sublimate, in which calcium is deposited in the necrosed convoluted tubules. In neither of these patients was there any possibility of this being an etiological factor, but the production of closely similar tubular lesions by a known necrotising agent is noteworthy.

The cardiac lesions were severe in case 2 and comparatively mild in case 1 but were essentially similar and consisted of destruction of muscle fibres with deposition therein of calcium. Convincing evidence of necrosis without calcification is absent, although in case 2 one probable such area was seen. The arterial change was similar to that seen in the interlobular vessels of the kidney (fig. 4).

The deposition of calcium in the stomach and lungs was not associated with necrosis. In any condition of hypercalcæmia, however, calcium is deposited in these sites irrespective of previous cell damage on account of relative cell alkalinity resulting from acid secretions.

The arterial lesions seen in the kidney, heart, spleen, liver, and many other organs as well as in the femoral and other larger arteries, consisted of deposition of calcium in an already damaged vessel. In the absence of any evidence of arteriosclerosis or atheroma it is suggested that the degenerative lesions seen are the primary result of the toxic action of excess circulating parathyroid hormone, and that the calcification is secondary to this change.

The lesions found in these cases appear to correspond closely with those previously reported (Dawson and Struthers 1923, Hanes 1939). Hanes emphasises "injury necrosis" as the essential lesion; from the ambiguity of the term it is not clear whether in his case necrosis was the primary lesion or secondary to injury from deposited calcium. Albright, Baird, Cope, and Bloomberg (1934) recognise three types of renal lesion in hyperparathyroidism: type I, stones with pyelonephritis; type II, calcium precipitates in the tubules with chronic kidney damage; and type III, 'acute parathyroid poisoning with anuria and death from undetermined cause in a few days, with calcium deposits in the kidneys and in other organs, but with no chronic renal changes.' They

had not seen a case of type III The cases herein reported appear to belong to this category. Careful study of the histological changes in experimental parathyroid hormone overdosage in rats and dogs (McJunkin et al. 1932, Cantarow et al 1938) indicate that necrosis always precedes calcification Although the kidney lesions, especially in case 2, closely resemble those in Cantarow's dogs, they are not strictly comparable, on account of the delayed fixation. No specific mention of arterial lesions, apart from calcification, is made, and an experimental proof of the hypothesis that overdose of parathyroid hormone can cause arterial degeneration is being attempted. Other experimental changes reported by Cantarow, such as focal fatty degeneration of the liver and hæmorrhages into the splenic follicles, were not seen in the cases under consideration.

That the pathological lesions are not simply the result of hypercalcæmia seems probable McJunkin was able to produce comparable lesions only after prolonged intraperitoneal injections of calcium gluconate and considers that direct toxic action of parathyroid hormone on the cells probably plays an important part (McJunkin et al 1932) During the experiment one of Cantarow's dogs delivered herself of a litter, in which, although a hypercalcæmia, comparable with that of the mother, was found, no necrosis or calcification in the organs was present, suggesting that the necrotic lesions seen in the mother were the result of excess parathyroid hormone and not of the hypercalcæmia (Cantarow et al 1938). In hypervitaminosis D, although there is persistent hypercalcæmia, the lesions produced, especially those in the kidney, are not like those produced in experimental overdosage of parathyroid hormone or like those produced in these two cases. An arterial degeneration, however, apparently similar to that observed, is sometimes seen in the experimental condition (Kleitmair and Moll 1928), and it may well be that the arterial lesion in these cases is merely the result of hypercalcæmia

CONCLUSION

Whatever the exact significance of the pathological changes or the mechanism of the mode of death, it is clear that these cases represent an important clinical syndrome, which it should be possible to recognise before death A clinical picture including vomiting, loss of weight, anorexia, bone pains, constipation, and lassitude, all of them recently exacerbated, with increasing drowsiness, and evidence of fever, disproportionate tachycardia, and impaired renal function without hypertension, should prompt a careful examination of the neck for a parathyroid tumour, estimation of the serum calcium and phosphorus, and radiography of the kidneys From the experiments of Shelling et al. (1938) and the clinical reports of others (Lowenburg and Ginsburg 1932, Schrumpf and Harbitz 1937–38) it appears clear that the ill effects may be reversible, and that, if suitable fluid and electrolyte replacement is carried out and followed by removal of the tumour, good results may be expected, therefore recognition of the condition and its speedy confirmation by investigation are of considerable importance.

SUMMARY

(1) Two cases of parathyroid chief-cell adenomata associated with widespread deposition of calcium are described. (2) The clinical features and histological findings are reviewed and compared with experimental lesions (3) The suggestion is made that the cases constitute examples of a clinical syndrome—acute hyperparathyroidism—which, if recognised, is amenable to therapy.

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THE EFFECT OF SULPHONAMIDES ON BLOOD-SERUM

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DURING the last few months we have been presented with a new problem by two cases under treatment with sulphonamide drugs. The phenomenon, we feel, is worth recording, even with so few cases, to invite observation and comment from others with more clinical material at their disposal.

CASE-RECORDS

CASE 1.—A boy, aged 14, was admitted on Nov. 2, 1938, with a history of an insect bite over the right hand a fortnight previously, followed by a whitlow on the same hand, a whitlow on a toe, and boils on the chest wall. During the next week he had shivering attacks, felt very weak, and developed a dull pain in the left hip. Two days before admission he developed a sore throat and a tight feeling behind the sternum.

On *admission* he was very weak and unable to move, he was flushed with circumoral pallor, and his skin was clammy. Temperature 103·4° F., pulse rate 120, respiration-rate 28. Respiration was rather laboured, with active alæ nasi. Some moist crepitations over the bases of both lungs Nothing abnormal was detected in heart, abdomen, or central nervous system. Local lesions included a healing septic spot over the back of the right hand, an extensive whitlow on the right little finger, a whitlow on the left big toe, and boils on the chest wall. The left hip was extremely tender on pressure anterior to the joint and over the greater trochanter; the movements were too painful to be tested.

On the 5th jaundice set in and was rapidly deepening. The liver was not palpable, and the band of liver dullness was very narrow. No leucine or tyrosine was found in the urine. A blood-count gave the following results —

Red cells	1,200,000	Polymorphs	85%
White cells	18,200	Lymphocytes	11%
Hæmoglobin	70%	Monocytes	4%

The blood belonged to group A, and the patient's father was compatible as donor. Blood-culture

produced a pure growth of *Staphylococcus aureus* Treatment was started with Ulcron (Bayer) gr 7½ four-hourly

On the 10th the temperature was settling and the jaundice disappearing The patient was extremely pale and weak Blood transfusion (drip method, 350 c cm. given over three hours) was followed by a severe reaction with several rigors and pyrexia up to 106 4° F Cross-grouping now showed a slight agglutination of the father's cells by the patient's serum

On the 12th a slight pericardial rub was detected On the 25th it was found that a large pericardial effusion had developed during the last few days The pericardium was tapped and 150 c cm of a cloudy yellow fluid removed, which contained 13,600 cells per c mm , being 05 per cent polymorphonuclear and 5 per cent endothelial cells A few red cells and cocci were also seen Culture produced a pure growth of *Staph aureus*

On Feb 27, 1939, it was noted that during the last three months several more joints had been involved in a purulent arthritis, but most of them had cleared up under treatment by extension immobilisation, and other methods, and ulcron had been given until today in the above-mentioned doses over ten days at a time with intervals of five days Temperature and pulse-rate had now been normal for some time, the heart dullness was normal, and the sounds were clear The left hip was ankylosed, and the left knee and ankle were completely disorganised and showed chronic suppuration The right knee and ankle and the left elbow, which had also been involved, were clear During this time the anæmia had not increased very much, but a further blood-transfusion had been thought to be helpful Six donors of the patient's own group (A) and two universal donors were tested, but all were incompatible The patient's cells showed all the time a clear group-A reaction

On April 11 the patient's left leg was amputated after a blood-transfusion (drip method, 500 c cm over three hours) The first donor tested (group A) was compatible This was twelve days after the last dose of ulcron

On May 31 the patient was still in hospital but convalescent and making good progress

The total amount of ulcron administered was gr 423 gr 36 in six consecutive days before the blood-transfusion on Nov 11, gr 366 between the first blood-transfusion and the second (given on April 11), and gr 21 in the next week

CASE 2.—A girl, aged 6, admitted on Dec 27, 1938, with a history of two days' fretfulness and refusal of food except fluids There was a vague pain in the left lower part of the abdomen Bowels and micturition were normal

On *admission* she had a dry tongue and a flushed and clammy skin Temperature 100 2° F., pulse-rate 120, respiration rate 24 There was some vague aching on movement of the left leg Otherwise physical and laboratory examination did not show any abnormalities

On Jan 3, 1939, the temperature suddenly rose to 101° F , the pulse-rate being 140 and the respiration-rate 36 A scarlatiniform rash developed over the forehead and spread rapidly over the rest of the body No other abnormal symptoms or physical signs were detected A blood-count gave the following results —

Red cells	3,000,000	Polymorphs	91 5%
White cells	55,400	Lymphocytes	4 5%
Hæmoglobin	70%	Monocytes	1 0%

There was a considerable "shift to the left" A blood-culture proved sterile Treatment with sulphanilamide gr 3½ four hourly was begun

On the 7th the rash had disappeared and temperature, pulse rate, and respiration rate were normal

On March 14 it was noted that such attacks of rashes combined with pyrexia had recurred three times, always without other physical signs and always quickly controlled with sulphanilamide The blood-picture always suggested suppuration, but no focus had been found. Radiography of the chest and joints and examination of urine, stools, and throat swabs had given negative results Blood-culture proved sterile on five more occasions A blood-count gave the following results —

Red cells	4,400,000	Polymorphs	81%
White cells	64 000	Lymphocytes	18%
Hæmoglobin	70%	Monocytes	1%

On the 18th a similar but more severe attack came on which lasted eight days On the 20th and 22nd blood cultures produced pure growths of hæmolytic streptococci Sulphanilamide was increased to gr 7½ six-hourly on the 20th The patient became weak and pale, and a blood-transfusion (drip method, 300 c cm) was given on the 23rd This was on the fifth day of treatment with sulphanilamide and the third after the dose had been increased There were no complications

On April 20 it was noted that there had been three more attacks but much less severe The patient was on sulphanilamide all the time, but no more blood-cultures had produced growths The patient had become anæmic again, and a further blood transfusion had been contemplated The patient's serum, however, had been found to agglutinate the cells of five donors tested, all being of her own group (group O) On the last occasion the serum of the patient had agglutinated her own cells after they had been washed in citrated saline solution By now the patient had become extremely pale Agranulocytosis (no sore-throat) was found for the first time A blood-count gave the following results —

Red cells	1,100,000	Polymorphs	3%
White cells	64 000	Lymphocytes	66%
Hæmoglobin	no estimation possible	Monocytes	31%

1 myeloblast, 1 normoblast, severe polychromasia and anisocytosis

Sulphanilamide was stopped, and the patient was given large doses of iron and occasionally liver extract by mouth Other treatment for the agranulocytosis was not given, for the excitement of undergoing injections was considered more than the patient could stand at this stage

On the 28th there had been no more attacks A blood-count showed hæmoglobin 25 per cent , 1,700,000 red cells, and 20,000 white cells, of which 30 per cent were polymorphonuclears Blood-grouping with a donor previously found incompatible showed perfect matching No further transfusion was given

On May 17 a blood-count showed hæmoglobin 80 per cent and 4,300,000 red cells

On the 31st the patient was well and putting on weight, the blood picture being normal She has just left hospital for a convalescent home

The total amount of sulphanilamide administered was gr 718 gr 170 during the early stages of the disease, gr 120 in five days before blood transfusion (followed by an interval of twenty days), and gr 428 thenceforth until agranulocytosis was detected

EXPERIMENTS

Struck by the similarity of these two cases with regard to blood-grouping, we tested the serum of six other patients under treatment with different sulphonamides for various conditions, such as local sepsis, pneumonia, and quinsy The patients were all adults and on comparatively smaller doses than were the above mentioned patients None of them gave any abnormal results as regards grouping and cross-grouping of their blood with corresponding donors

We next investigated the action of these drugs in vitro and as a result we found that normal serum treated for some considerable time (four days and

more) with (in our case) sulphanilamide in a concentration of about 2½ per cent appears to agglutinate any cells tested—i.e., cells derived from donors of the corresponding group or from universal donors

SUMMARY

(1) Two cases are described in which treatment with a sulphonamide over a long period and in large doses (uleron gr. 423 in one case and sulphanilamide gr. 748 in the other) was followed by an alteration in the blood-serum which precluded the finding of a suitable donor for blood-transfusion

(2) Normal serum treated in vitro with sulphanilamide for four days or more agglutinated the red blood-cells of donors of the corresponding blood-group and the cells of universal donors.

(3) When these drugs were administered over shorter periods and in smaller doses to six other patients such a change in the blood-serum did not take place

Our thanks are due to Dr. C. Carron Brown and Mr T. E. Stoker for permission to publish these cases.

A CASE OF CHLOROMA

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THE rarity of chloroma, and our consequently limited knowledge of the condition, leads me to publish a case treated at the Cardiff Royal Infirmary.

CASE-RECORD

A married man aged 25, a carpenter, was admitted to the infirmary on Oct. 15, 1937. Apart from scarlet fever in childhood he had always been healthy, and there had been no relevant illnesses in his family. About three months before admission he began to complain of general malaise, backache, lassitude, and anorexia, with attacks of vomiting, "rheumatic" pains in all his limbs, and steadily increasing deafness. At the same time he noticed a small swelling over the mid-sternal region and another over the third left costal cartilage. These swellings were hard, painless and varied in size. Sometimes they almost completely disappeared to become noticeable again a few days later. Soreness of the gums and teeth developed simultaneously with severe backache which forced him to give up his work three weeks before admission to hospital. Later he had diplopia, and this was followed by dimness of vision and bleeding from the gums.

On admission the patient's temperature was 99·6° F.; pulse-rate 130 per minute, regular and of fair volume. He looked ill and was very pale and thin. His skin was moist and clammy. He was almost comatose and lay in bed listlessly with his legs drawn up to relieve the pain in the back. There was a lump the size of a hen's egg over the lower portion of the sternum and attached to it. His tongue was dry and coated. The tonsils were normal in size and slightly reddened. The gums were bleeding, but no ulceration was visible in the mouth or throat. No abnormality was noted in the abdomen apart from some enlargement of the liver and spleen. No physical signs were found in the heart or lungs. B.P. 126/18. The central nervous system was normal, except for some retinal hæmorrhages, with blurring of the disks and white patches of exudate. The lymph-glands in the left cervical, both axillary, and inguinal regions were enlarged, discrete and firm. Urine sp. gr. 1·020; much albumin; no Bence-Jones proteose.

Blood-count (Oct. 15): Hb., 16 per cent.; red cells, 1,200,000; colour-index, 0·67; white cells, 11,000.

Blood-count (Oct. 17): Hb., 14 per cent.; red cells, 800,000; C.I., 0·88; white cells, 17,000 (polymorphs 21 per cent., lymphocytes 37 per cent., myelocytes 42 per cent.). Many myeloblasts. Red cells showed anisocytosis and poikilocytosis. Bleeding-time, 13·5 min. Clotting-time, 6·25 min.

Aspiration of the tumour was attempted with a wide-bored needle, but nothing could be withdrawn. The tumour was subperiosteal and was semi-solid. The patient deteriorated rapidly, vomited a number of times, became weaker, and died four days after admission to hospital.

Post-mortem findings.—The body was very thin and extremely pale with a few petechiæ, mostly about the root of the neck. An old scar was noticed about the inner side of the right thigh above the knee. A swelling 1 in. in diameter was present over the lower end of the sternum. Tumour deposits were found in the ribs, the posterior surface of the sternum, and the lower dorsal, lumbar and sacral vertebræ. Most of these deposits were subperiosteal. There was also one subperiosteal deposit in the vertex of the skull. On section the tumours were green, quickly fading to grey on exposure. The tissue was of a firm consistence. The spleen was somewhat enlarged and soft with prominent malpighian bodies. The pulp was pink with dark mottling. There was no notable enlargement of the lymph-glands. The marrow of the upper end of the femur was hyperplastic and green, but in the tibia it appeared somewhat gelatinous.

Several petechial hæmorrhages were visible under the epicardium. Numerous deposits were palpable in the myocardium. The heart was left unopened and preserved as a specimen. No abnormality was found in the aorta or other vessels. The lungs showed several subpleural petechiæ, with some hæmorrhages into the lung substance of the lower lobes. Both lungs were œdematous. The gums were hæmorrhagic and there was some chronic tonsillitis. Many disk-shaped deposits were found in the stomach wall. The pancreas also contained masses of tumour. The liver looked pale but otherwise normal. Small deposits were also found in the kidneys and the right testicle. The nervous system was normal except for a tumour deposit in the dura mater of the right middle fossa.

Microscopical examination.—The deposits contained large numbers of cells of the myeloid type. The liver showed leukæmic infiltrations of the portal tracts. A lymph-gland from the neck showed an increase of "endothelial cells."

The disease was described by Allen Burns about 1821 (Burns 1823), but the name chloroma was first used by King in 1853. In 1910 Lehndorf collected and reviewed the data of some 73 cases reported up to that time. Brannan (1926) noted the details of a further 74 cases recorded between 1910 and 1926, of which he was satisfied that 56 were definitely chloroma. Kandel (1937) has since collected 80 cases reported between 1926 and 1936, though he was only able to confirm the diagnosis in 46 of these. This makes a total of 175 cases up to 1936. The literature since that year contains reports of about 12 more cases. Including the present case an aggregate of about 188 cases have therefore been reported since 1821.

PATHOLOGY

Chloroma is a rare type of leukæmia in which tumours are formed in the bones. These usually appear both under the periosteum and in the bone-marrow. The growths may be found in any bone in the body but the most frequent sites are in the bones of the face and skull, more especially in the orbit. The sternum, ribs, vertebræ and pelvis are common but less frequent situations. Infiltration of the soft tissue with tumour deposits is also an important feature—e.g., the liver, spleen, kidneys

muscles, lymph glands, skin, breast and ductless glands Brannan states that no tissue is entirely exempt from deposits except possibly the brain and spinal cord Critchley and Greenfield (1930) have described cases of compression paraplegia due to spinal meningeal deposits The case reported by Rothschild (1926) showed a focal cerebral lesion According to Kandel discrete tumours in neural tissue are not described The nervous system is only indirectly involved through pressure and circulatory disturbances due to the presence of deposits in the surrounding structures, such as the dura mater and spinal canal. However, sections sometimes reveal infiltrations of peripheral nerves, and this seems to be one reasonable explanation of the limb pains

The tumour masses usually have a green colour which fades on exposure to the air Rarely the colour is stable, and in some cases it is entirely absent The colour can often be restored if the tissue is immersed in hydrogen peroxide Glycerin is said to preserve the colour (Meyer and Berger 1924) The nature of the pigment is obscure It is believed to be a lipochrome and to contain iron Meyer and Berger have reported absorption bands in the spectrum at 645 and 490 Some writers have associated the colour with eosinophil cells, but there is no constant relationship between the amount of colour and the number of these cells present In fact, eosinophil cells do not seem to be present in large numbers either in the blood or the tumour tissues Ashanazy (1917) thinks the green colour is due to the myeloid cells Both he and other workers have sedimented the myeloid cells in leukæmia and chloroma and noticed that these cells had a green colour which slowly faded

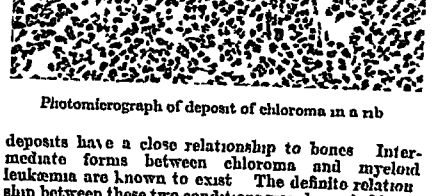
Blood changes.—Accompanying the tumour formation there are changes in the blood picture similar to those of acute leukæmia The leucocyte-count may be normal, about 8000 per c.mm., or may be increased to about 400,000 per c.mm., the majority of the cells being of the myeloblastic type (Burgess (1912) quotes 1,888,000 per c.mm. as the highest count and Pissavy and Richet (1912) 3200 as the lowest.) Many of these cells give a positive peroxidase reaction Some authors suggest that the results obtained in this test may vary with the method of performing the reaction and they advise that more than one technique should be adopted Occasionally the cells are reported as lymphoblasts, but most of these are now regarded as myeloblasts on more careful investigation The usual difficulties arise in differentiating the various forms of the more primitive leucocytes—a common problem in the interpretation of films in many blood diseases

The blood-count in some cases may resemble that found in aleukæmic leukæmia Brannan (1926) thinks that these counts are just phases in the disease, and that if sufficient counts are made in each case, a leucocytosis will be demonstrated at some time As in leukæmia, the blood picture may show changes similar to those seen in pernicious anæmia, with anisocytosis and poikilocytosis The bone marrow also shows evidence of red-cell regeneration

Other investigations that have been done, such as blood-calcium and blood phosphorus estimations, have been reported on as normal Only one author reports the presence of Bence Jones proteose in the urine

Microscopically the tumours are composed of cells similar to those seen in the blood—i.e., myeloblastic tissue (see figure) Lehndorff divided the cases according to whether or not the tumour tissue and the blood contained lymphoblastic or myeloblastic cells Burgess (1912) strongly maintained that the cells were myeloid in type Most writers now seem to hold this view The same difficulty arises in identifying the types of cells in the tumours, as in differentiating the leucocytes in the blood-films Myeloblasts and lymphoblasts both give a negative peroxidase reaction A positive reaction is, however, usually obtained, and this is explained by the presence of sufficient of the more mature leucocytes—pre-myelocytes and myelocytes

Unlike ordinary leukæmia, the tumour deposits infiltrate the tissues like malignant disease, and resemble deposits of another uncommon bone-marrow tumour, multiple myelomata Chloroma in its mode of tissue infiltration resembles lympho-sarcoma, except that in the former disease the



Photomicrograph of deposit of chloroma in a rib

deposits have a close relationship to bones Intermediate forms between chloroma and myeloid leukæmia are known to exist The definite relationship between these two conditions was shown in blood-films by Dock in 1893 The disease seems to be a variety of leukæmia, in which the changes found in the bone marrow have become so active as to suggest a neoplastic form of leukæmia. Our present knowledge of the disease does not seem to have advanced much since 1904 when Dock and Warthin wrote "Chloroma is a tumour like hyperplasia of the parent cells of the leucocytes, primary in the red marrow, the periosteum being secondarily involved The possibility of a primary chloroma in any part of the body in which white cells are formed must be considered" However, although deposits of chloroma possess local invasive characters similar to those exhibited by carcinomata and sarcomata, the mode of dissemination of chloroma throughout the body does not resemble the spread by lymphatics and the blood stream as in malignant disease

CLINICAL COURSE

The malady affects children, usually males, and less often adults The symptoms resemble those of acute leukæmia with the addition of tumours in connexion with bones. There is usually a preliminary period of malaise general weakness, wasting "rheumatic" pains in the bones, and some fever This is soon followed by changes in vision and hearing Simultaneously a severe anæmia develops with petechial hæmorrhages bleeding from the mucous membranes and septic ulceration of the mouth and throat The spleen liver and lymph glands are usually enlarged, though not invariable The retina may show hæmorrhagic exudates There are also palpable periosteal tumours and classical cases have orbital swellings causing exophthalmos Masses may commonly be felt on the sternum ribs and sometimes in the skin Huber (1878) and Simon (1912) each reported a case with signs of a malignant tumour in the breast and a radical amputation was performed

Another interesting case with signs resembling mastoiditis was published by Lewis (1919).

Reviewing the literature, the disease seems to present itself in two clinical forms: (*a*) that affecting children, in whom rapidly growing bony tumours are prominent, and usually called chloroma; and (*b*) that affecting older patients, in whom a progressive anæmia and signs of leukæmia are more predominant, and usually called chloro-leukæmia. In both types, however, the two essential features of chloroma are present—viz., leukæmic changes in the blood-films and green tumour deposits in bones.

Radiologically none of the appearances produced by chloroma in the skeleton can be said to be diagnostic. There may be periosteal elevation with new bone formation laid down in the striæ, either parallel or perpendicular to the shaft of the bone. Osteoporosis may either be generalised, or it may be seen as pin-point areas of destruction, as larger punched-out areas, or as erosions near the ends of the diaphyses. There are no changes in the epiphyses—a feature which distinguishes the condition from scurvy and rickets. Similar radiographic appearances to those of chloroma may also be produced by leukæmia, more especially the lymphatic variety, and by other bone diseases—namely, Ewing's tumour, osteogenic sarcoma, carcinomatous deposits, myelomata, sarcomata, congenital syphilis, and Hodgkin's disease.

The disease is always regarded as fatal. The average duration is about 6 months, but cases have lasted as long as 18 months. No effective treatment is yet known. Irradiation with deep X rays and radium have yielded no success, and appear to make the condition even worse. Drug therapy has produced equally bad results. Blood-transfusions only produce temporary benefit and do not stem the pathological process. Nevertheless two recoveries are recorded in the literature. In the case described by Lecene (1927) a green tumour was excised from the humerus and reported on as myelocytic chloroma, though the blood-count was normal. This was followed by deep X-ray therapy and the patient was reported to be alive and well 2 years later. Washburn (1930) described a case in a boy aged 22 months. A green tumour was excised from the skull and reported upon as a myelocytoma. Another tumour was present in the femur, and the blood-count was reported on as doubtfully leukæmic. Deep X-ray therapy was given. After treatment the blood was said to be normal. The patient was well 2½ years later. In neither of these cases does the diagnosis of chloroma seem to be strongly established, for the usually accepted criteria do not seem to have been fully satisfied. In both cases green tumours were described, but in Lecene's case the blood was almost normal, and in Washburn's patient the blood-films were not very definitely leukæmic.

SUMMARY

A typical case of chloroma is described in a young adult. The condition is rare, less than 200 cases having been reported since 1821. It is characterised by (*a*) the appearance in bones of green tumours composed of myeloblastic cells which infiltrate the tissues like malignant disease, and (*b*) a blood-picture resembling myeloblastic leukæmia. Tumour formation is the most prominent feature in children and progressive anæmia in adults. The disease is usually fatal within 18 months.

I wish to express my thanks to Dr. Herbert T. Evans for his permission to publish this case; to the staff of the department of pathology of the Welsh National School of Medicine for the post-mortem details and the photomicrograph; and to Dr. Marjorie Bryan, the house-physician of the case, for her help with the clinical notes.

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REDUCTION OF POTASSIUM TELLURITE IN DIPHTHERIA

AND OTHER THROAT CONDITIONS *

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THE announcement of the possibility of more rapid diagnosis of diphtheria (*Lancet*, 1938) is always sufficiently important to demand investigation into the accuracy of the methods suggested. Dr. Alfredo Manzullo (1938) claimed that if a 2 per cent. solution of potassium tellurite, not more than a month old, were painted on the white exudate on the tonsil of a patient suffering from diphtheria, the membrane blackened within fifteen minutes—owing to reduction of the tellurite—but that no change took place in similar conditions such as streptococcal tonsillitis. He also claimed that a rapid bacterial diagnosis could be made in vitro by incubating a swab in a special liquid tellurite medium for three hours and observing black colonies on the swab in cases which were due to diphtheria, or the failure to produce any blackening in cases that were not.

We have compared the results of the in-vivo test with the clinical and bacteriological findings in a series of 84 cases and the results of the in-vitro test with the bacteriological findings in a series of 277 swabs. A swab (taken before the in-vivo test was made) was inoculated on the Löffler's medium, then on to a McLeod's tellurite plate, and then subjected to the in-vitro test. The bacteriological findings were obtained without a knowledge of the result of the in-vivo test, which was made by one of us (B. A. P.) along with the clinical observations. The result of the in-vitro test was recorded for each swab before a bacteriological diagnosis had been made and in the absence of clinical knowledge of the case. All strains isolated on McLeod's tellurite were typed according

* Based on a paper read at the Birmingham meeting of the Pathological Society on July 8.

to his classification (Cooper et al. 1936) Any case giving granular forms from Löffler when stained by Neisser, which failed to appear on the tellurite plate, was subcultured from the Löffler to tellurite and the strain isolated investigated to see whether it was diphtheria or a diphtheroid (Only 9 such swabs appeared in the 277 examined, and from 4 of them diphtheria was isolated The other 5 were apparently diphtheroids)

THE IN-VIVO TEST

Table I gives the results of the in-vivo test compared with the clinical and bacteriological findings "Severe" cases mean cases with extensive membrane and œdema of the neck in which the clinical diagnosis was certain "Moderate" cases are those with well marked membrane but no œdema of the neck. "Doubtful" cases include cases of follicular tonsillitis with patches of exudate, 1 case of Vincent's angina, and 1 case of agranulocytic angina with white sloughs on the tonsils In 57 cases where *Corynebacterium diphtheriæ* was found 55 were intermediate, 1 gravis, and 1 mitis

TABLE I—IN-VIVO TELLURITE TEST

Clinical condition	Bacteriologically positive		Bacteriologically negative		Total
	Reduction	No reduction	Reduction	No reduction	
Severe	17	5	2	1	25
Moderate	22	5	0	1	28
Mild or doubtful	5	3	15	8	31
Total	41	13	17	10	81

In the 25 severe cases in which the clinical diagnosis was certain there were 6 negative in-vivo tests In 2 other cases we failed to grow *C diphtheriæ* although the in-vivo test was positive We have not infrequently observed with this type of diphtheria that the original throat swab may be negative and may be followed later by a positive swab In 27 out of the 28 moderate cases *C diphtheriæ* was isolated, and 5 of these gave negative in-vivo tests Therefore, out of 52 definite cases of diphtheria, the in-vivo test failed in over 20 per cent of cases

Of the 8 doubtful cases in which *C diphtheriæ* was recovered 3 gave negative in vivo tests It might be that in these cases this organism was not the real pathogen A more noticeable feature of this group was the number of false positives—15 in which no *C diphtheriæ* could be recovered Of the 15, 4 were scarlet fever cases with patchy tonsils, 1 Vincent's angina, 1 agranulocytic angina, and 9 follicular tonsillitis If all the cases in which *C diphtheriæ* was recovered are included, the in-vivo test gave 13 false negatives out of 57 bacteriologically proved cases In the 27 cases in which this organism was not recovered the in-vivo test gave 17 positives, and probably 15 of these were false positives With such a high percentage error in both directions, it is doubtful if the test is of any great value

THE IN-VITRO TEST

The results of the comparison of the in-vitro test with the bacteriological findings are shown in table II In the results on 100 cases Manzullo (1938) does not include any doubtful reactions We have found difficulty in several cases in deciding whether his test was positive or negative, for indefinite grey discolorations appeared Such results have been separated from the definite ones and called doubtful, they have been excluded from table III entirely As regards nasal swabs, such reactions were usually on swabs which proved to be negative for diphtheria,

TABLE II—IN-VITRO TELLURITE TEST

—	Bacteriologically positive			Bacteriologically negative			Total
	Reduction	Doubtful	No reduction	Reduction	Doubtful	No reduction	
Throat	43 (68%)	13 (21%)	7 (11%)	34 (34%)	21 (21%)	44 (45%)	162
Nose	7 (28%)	1 (4%)	17 (68%)	12 (13%)	19 (21%)	59 (66%)	115

but as regards throat swabs they were more numerous and an equal percentage of bacteriologically positive or bacteriologically negative swabs gave doubtful reactions

Manzullo claimed accuracy for this method only as regards throat swabs and said that nasal swabs did not give satisfactory results Table II shows that 68 per cent of bacteriologically positive nasal swabs are negative by this test With throat swabs on the other hand, 88 per cent of bacteriologically positive swabs gave some darkening Thus suggests that factors other than the presence of diphtheria organisms are necessary for the reduction of tellurite Swabs soaked in pure cultures of diphtheria give no reduction by the test Preliminary experiments reported by Manzullo suggest that fibrin may play a part in the reduction The results on positive throat swabs do not in themselves suggest that the test is without value, but table II shows that bacteriologically negative swabs also give a positive test in 34 per cent of cases and a doubtful result in a further 21 per cent It thus seems probable that the reduction depends not so much on the presence of diphtheria

TABLE III—IN-VITRO TELLURITE TEST (EXCLUDING DOUBTFUL RESULTS)

—	Positive test		Negative test	
	Confirmed bacteriologically	Not confirmed	Confirmed negative	Bacteriologically positive
Throat	43 (56%)	34 (44%)	44 (87%)	7 (13%)
Nose	7 (37%)	12 (63%)	59 (77%)	17 (23%)

organisms on the swab but of organisms plus some additional factors, which are yielded by throats subjected to certain types of inflammatory reaction We hope to publish investigations now proceeding to determine the factors responsible for this reduction Manzullo says that after reading the results of the in-vitro test, they are confirmed by making films and staining by Gram's method We have found it impossible to distinguish *C diphtheriæ* from the diphtheroids usually present under these conditions The films showed an abundance of pleomorphic organisms, and we found no certain distinction between bacteriologically positive or negative swabs Some of the swabs giving most reduction of tellurite showed an abundance of fusiform bacilli and spirochætes suggesting that anærobic conditions were established during the three hours incubation, despite the fact

that the position of the swab provided for maximal aeration during the test.

If the results are expressed in another way and doubtful reductions are excluded, table III shows that we have failed to confirm the diagnosis of diphtheria in 44 per cent. of throats (and even a higher percentage of noses) giving a positive in-vitro test. Even with a generous allowance for the possibility of our failure to isolate the organisms in some cases of true diphtheria it is impossible to conclude otherwise than that many false positive reactions are given, which render the test of little value as an aid to the diagnosis of diphtheria. The sequence of the different examinations on each swab was such that possibly a few cases might be missed by the Manzullo test because the only organisms present on the swab were rubbed off by the inoculations on the other media before this test; but this could never cause false positive results (Control swabs impregnated with media and submitted to the test always remained white.) The occurrence of these false positives is also independent of the type of diphtheria present, though it must be remembered that, if other organisms play a part in the reduction, they may vary in type and distribution in different districts; hence the percentage error found in Bristol may not be universal. Nevertheless it is apparent that in some districts at any rate the test is misleading and of doubtful value. Until a knowledge of the factors contributing to the reduction is obtained, its real significance cannot be assessed. Seeing that "bacterial cultures are nearly always strongly reducing systems" (Hewitt 1935) during the early stages of bacterial growth, it is not unexpected that the test is not specific for diphtheria.

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INSULIN PREMEDICATION IN CONVULSION THERAPY

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THE purpose of this short paper is to demonstrate how a common difficulty in the use of Cardiazol and triazol in convulsion therapy for schizophrenia has been met at Claybury. I refer to the symptoms of resistiveness, fear, and panic.

Resistiveness is known to be one of the commonest features of schizophrenia, particularly in its catatonic form. One would therefore expect to encounter resistance in convulsant injections just as extensively as in other events; the more so when remembering that timidity is a common trait in the personality of the schizophrenic patient. Further, it is not unreasonable to suppose that such patients become frightened of a drug, the injections of which, they must eventually realise, will produce a loss of consciousness twice a week, even allowing for the fact that more alarming sensations are not recollected. In this connexion it is surprising to read Meduna's statement (1938) that only a few of his patients fear the cardiazol injection and none have exhibited the states of panicky fear described by some workers. Numerous writers in this country confirm the distressing nature of the sensations which the injections cause (Harris 1938, Russell 1938, Walk and Mayer-Gross 1938, Gillespie 1939), and my own cases have been no exception in this matter.

RATIONALE AND TECHNIQUE

It has always been the aim in convulsion treatment at Claybury Hospital to eliminate the "negative injection" so far as possible. In spite of this policy 12 patients developed considerable apprehension and states of panic after the completion of a few fits, even though the injection had always been promptly followed by a "grand mal" attack. To meet these difficulties, various sedatives were tried as premedicating agents to allay fear. Barbiturates and the once advocated morphine and hyoscine proved useless because of the large proportion of "negative injections" that resulted. Insulin has so far proved the most satisfactory agent in that it diminishes the patient's fear and facilitates the onset of the fit, with the result that the convulsion is effected with a smaller dose than before. Insulin has also proved beneficial in reducing the confusion and restless excitement which some patients show on recovery from a fit.

The object in insulin premedication is to give such a quantity as will induce coöperation with the injection of a convulsant drug. The dose may require pushing until drowsiness and languor supervene, but in 11 patients it has been possible to secure coöperation without the onset of obvious drowsiness. On such a basis it is clear that this form of medication differs entirely from the "summation therapy" of Georgi (1937), in which the coma-producing dose of insulin is first determined and the cardiazol injection planned to coincide with the "*turning-point*" in hypoglycæmia. A scheme of stepping up the dosage is used similar to that employed in insulin shock. The patient is started with ten units and the injection increased by tens until the desired coöperation is obtained. In 3 patients one could not say that the coöperation was entirely satisfactory, but resistance was so far decreased that the injection was carried through with little trouble. On almost every occasion the induction of the fit has been sufficient to dispel any lethargy induced by the insulin. The patients are given sugared tea to drink as soon as the fit is over. In 2 cases, owing to the development of insulin sensitivity, recovery was effected with glucose solution through the nasal tube on one occasion and with intravenous glucose on two other occasions. As with cardiazol therapy, the management of the premedication can be performed by the nursing staff of the ordinary mental hospital without the degree of special training necessary for insulin-shock summation methods.

RESULTS

Of the 23 patients dealt with in this paper 15 were given cardiazol, 6 triazol, and 2 cardiazol and triazol at different times. Since the present series forms part of a total of over 70 patients, and of this number 25 have been treated with triazol, it appears that triazol shows no particular immunity from the reaction which insulin premedication is designed to meet, though such has been suggested by some authors.

Insulin has enabled me to complete a course of convulsant treatment in 22 out of 23 cases, which courses would otherwise have had to be prematurely terminated because of resistance and apprehension. In case 3 the course was stopped because of the excessive exacerbation of symptoms on recovery from each fit. The patient's condition deteriorated,

and it was considered inadvisable to continue the treatment

Two points emerge from results summarised in the accompanying table (1) the high proportion of

RESULTS OF INSULIN PREMEDICATION IN CONVULSION THERAPY

Case	Cardiazol (C) and Trizol (T) cases	Before insulin pre medication		With insulin pre medication		Total convulsions	Maximal dose of insulin	Results
		Successful convulsions	Negative injections	Successful convulsions	Negative injections			
1	C	7	3	14	3	21	100	OR*
2	C T T	12	7	11	—	23	100	I
3	C T T	1	—	3	—	4	60	I
4	C	2	—	13	—	15	70	I
5	C	24	4	12	1	36	80	I
6	C and T	17	11	4	—	21	60	I
7	C C C	16	—	9	—	25	40	I
8	C	8	3	5	1	13	60	NC
9	C	8	8	14	3	22	90	NC
10	C C T	10	2	11	—	21	70	I
11	C C T	4	2	14	2	18	60	CR†
12	C	6	—	15	—	21	40	I
13	C C C	3	2	4	3	7	35	NC
14	C	1	—	26	4	27	50	I
15	C C T	15	5	9	3	24	100	NC
16	C T T	17	1	2	—	19	30	NC
17	T	1	—	5	—	6	20	NC
18	T T T	3	—	14	2	17	80	I
19	C	10	4	16	1	26	100	I
20	C C C	7	3	7	—	14	30	I
21	C	4	2	8	2	12	90	I
22	C C C	8	1	8	—	16	70	I
23	C and T	7	2	5	4	12	50	OR*
		191	59	229	30			
Percentage of "negative injections"		30		13		Complete remission, CR 3 Improved I 14 No change NC 6		

* Discharged † Relapsed on trial

"negative fits"—namely, 30 per cent—which took place without insulin in these resistive patients was reduced to 13 per cent with insulin, and (2) there have been but 3 patients discharged in the small series, and 1 has since relapsed This is a very inferior figure compared with most of the published statistics and with the discharge rate for all cases treated at Claybury, which is about 42 per cent

SUMMARY

In patients undergoing convulsion therapy with cardiazol or trizol, the development of resistiveness, fear, and panic during treatment has been noted Sedatives such as morphia, hyoscine, and the bar biturates proved unsatisfactory in allaying these symptoms, on account of the "negative injections" which resulted Insulin premedication not only proved effective in obtaining coöperation in 22 resistive patients but also reduced the incidence of confusion and excitement on recovery from the induced fits This use of insulin, by greatly diminishing the unpleasantness of convulsion treatment to resistive schizophrenic patients, has facilitated their nursing and management

I wish to thank Dr J S Harris for his advice and for permission to publish this paper.

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THE USE OF PENTOTHAL ACID IN MIDWIFERY

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Various methods of relieving pain during parturition have been tried and acclaimed, only too frequently to fall into disrepute At present most of the patients confined in institutions or hospitals in this country and many of those who elect to bear their children at home receive gas and air from one of the machines now available The analgesia is usually started at the beginning of the second stage of labour, and good results are obtained in most cases During the first stage, however, the mother undergoes a genuine discomfort which gradually increases in intensity, especially in primiparæ, who become progressively more apprehensive and perhaps exhausted as the pains mount to a crescendo Efforts therefore have been made in the past to produce analgesia and/or amnesia and have met with various degrees of success Twilight sleep, in which morphine and scopolamine were employed, and the use of Nembutal are probably the two best known methods which have been tried In the former, narcosis of the infant was frequently found (Burrows 1933), and in the latter, restlessness was noted in 20 per cent of the patients (O'Sullivan and Craner 1932), with prolongation of labour in other cases

The oral use of Pentothal Sodium as an analgesic and hypnotic in labour has already been reported on by Macphail, Gray and Bourne (1937), who have declared themselves satisfied with the results they have obtained For the sake of convenience of administration, it was decided that the use of a slightly more stable form of this drug would be expedient In response to inquiries the manufacturers very kindly produced a large supply of the more stable compound, Pentothal Acid

With the aid of the staff of the maternity unit I have administered this drug orally to a series of 200 women in labour at the Middlesex Hospital, having in mind the following criteria (1) the drug should not cause any excitement or have any harmful effect on the mother or on the fœtus, as evidenced by fœtal distress before birth, or by fœtal narcosis after birth, (2) a reasonable degree of analgesia and/or amnesia should be attained, and the drug should be easily administered and should not necessitate the constant presence of a qualified medical man in view of the possibility of sudden untoward occurrences, and (3) labour should not be prolonged In these 200 cases we have had very gratifying results, and we feel that, when properly used and with its limitations realised, pentothal acid will be very beneficial in the relief of the pains of labour

TECHNIQUE

When the pains begin to cause genuine discomfort, which is usually when they come on at intervals of five to seven minutes, the patient is given gr 6–8 of pentothal acid, this is repeated three quarters of an hour later From that point up to as near to delivery as is convenient for its administration, a dose of gr 2–4 is repeated every half to one hour, depending on the response of the patient, usually a dose every three quarters of an hour gives a good result

The mother usually becomes drowsy and sleeps between the pains, she wakes up with each pain but is not very distressed, and, so soon as the pain has finished, she again drifts off into a light sleep, from

which she can easily be aroused and will talk and answer questions in a perfectly intelligent manner. It is a pleasing experience to see a woman in the first stage peacefully sleeping between pains and yet waking up calm and refreshed as they recur.

At some time or another during the second stage we start giving gas and air to the patient. We have recorded instances when this has been refused. It is towards the end of the second stage that the value of the pentothal becomes most apparent. By the time that delivery takes place, the patient has usually had gr. 25–35, and the full benefit of the drug is then realised: in 80–85 per cent. of cases the woman is in a drowsy placid state, exhibiting a degree of quiet and willing coöperation that is indeed gratifying, obeying the obstetrician's orders while the pains are present, and resting quietly in between them.

RESULTS

We have not been able to detect any signs of harm coming to the mother through the employment of this technique, and, although in 7 per cent. of our cases we have been unable to reduce to a state of absolute coöperation already wildly excited members of our Soho clientele, we have yet to witness a case in which this drug has actually caused excitement. We lay special emphasis on this point, for, even when certain drugs may cause excitement in only a small percentage of cases, it is the uncertainty of not knowing whether or not each case that comes along will be a good one or a bad one in this respect that worries the obstetrician and the anæsthetist.

In our 200 cases we have had 5 stillbirths: in 4 of these tentorial tears were found post mortem, 3 of the 4 patients having been delivered by forceps; in the 5th case there was a tight knot in the cord with no pulsation palpable on the fœtal side of it. Not even by the most exacting standards, therefore, could these deaths be traced to the effects of the drug. Apart from these, all the babies in the series have breathed spontaneously, in most cases as soon as the head was born. This absence of respiratory depressant effect in the child has already been noted, in reports on the intravenous use of pentothal, both by Solomons (1936) and by Kassebohm and Schreiber (1938)

The degree of analgesia attained is good, but the degree of amnesia, although variable, is not great; at first we were disappointed about this, but latterly we have revised our opinion for two reasons: (1) we have come to the conclusion, as a result of questioning our cases, that most women do not want the birth of their child to be an "absolute black-out" in their memory; and (2) we feel that, if the drug gives a good degree of analgesia, the need for anything more than a slight degree of amnesia, a bemusement of the senses, is automatically cancelled The amount of genuine relief obtained by the summation of partial analgesia and partial amnesia is very considerable

The duration of labour is not, so far as it is possible to say, lengthened by the administration of pentothal; often indeed it appears to be shortened, owing possibly to increased tonicity of the uterus It is because of this possibility of increased tonicity that we refrain from administering pentothal acid to cases of trial labour until it is certain that the head will go through, and to occipitoposterior cases until the head is rotated. The only other contra-indication to the use of pentothal is toxæmia of pregnancy

Invariably have we found that the more intelligent the patient and the more willing to coöperate, the better are the results Some women are determined from the outset to extract the last ounce of dramatic value from their labour, and we fear that in these cases little can be expected in the way of good results In the case of a woman who is willing to coöperate, however, results are good, and to obtain this result it is essential that the woman be told that she is being given a drug which will help her to sleep between the pains and will ease the pains when they come on. She should be further instructed to close her eyes at the end of each pain and to "allow" herself to go to sleep. There is no need to darken the room, but the patient should not be distracted by having strong sunlight pouring into the room and should be subjected to as little questioning and examination as is possible.

The forceps-rate in the series was 13 per cent. compared with 12 per cent. for the corresponding period last year. The ratio of primiparæ to multiparæ was 79 per cent. to 21 per cent.

Although we have stated the usual total dosage to be gr. 25–35, we have given up to gr. 65 with no untoward effects upon mother or child.

It is hard to differentiate between any of the excellent gas-and-air machines on the market, but we have found that the Wellhouse model, as described by Elam (1938), gives good results.

We have no hesitation in giving pentothal to any normal case of labour and have never regretted having done so, the results being eminently satisfactory in almost every instance

SUMMARY

(1) Pentothal acid has been given to a series of women in labour in an attempt to ease their ordeal.

(2) The results have been very good: no harm comes to mother or child and labour is not prolonged.

(3) The patient sleeps between the pains and experiences a reasonable degree of analgesia; there is also some amnesia

(4) The patients are almost invariably extremely coöperative during delivery.

(5) The administration of pentothal acid is simple and special precautions are not necessary

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THROMBOSIS AFTER INJECTION OF PENTOTHAL SODIUM

By Frankis Evans, M.B. Lond., D.A.
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Periodically cases are reported in which extensive thromboses occur in veins after the intravenous injection of Pentothal Sodium For this reason the strength of the solution injected has been reduced from 10 per cent to 5 per cent. However, experience shows that even with this weaker solution thrombosis does occur occasionally, as in the following case.

The patient was a man of middle age, stocky of build, and well covered. He was obviously of sedentary habit but had no organic lesion of the

vascular or respiratory system He came under my care after a decision to manipulate his spine For this purpose he was given Omnopon gr ½ and scopolamine gr 1/150 by hypodermic injection half an hour before the intravenous injection of pentothal sodium 0 5 g in a 5 per cent solution The injection was made cleanly and easily into a prominent vein in the antecubital fossa, it took less than two minutes, and no fluid was allowed to escape around the vein Forty-eight hours later the vein was tender and hard, but there was no redness or swelling round it On discharge the patient had a hard cord, which was obviously the thrombosed vein, running up towards the axilla for some five inches, but it was no longer tender or painful

Thrombosis is the penalty frequently paid for long continued intravenous therapy, such as the postoperative use of saline, and this is not altogether unexpected However, when thrombosis occurs after the injection of a 5 per cent solution of pentothal, which only takes two minutes at the outside, it gives us cause for serious reflection It will be interesting to note whether the use of a weaker solution averts this unpleasant occasional sequela

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MEDICAL SOCIETIES

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

(Concluded from p 202)

AT the meeting of the association on July 13 and 14, Dr E A CARMICHAEL (London) opened a discussion on the

Physiopathology of Epilepsy

He said that, besides the sympathetic nervous system, other factors controlled cerebral blood vessels, such as local intra arterial pressure and gas tension and adrenaline like and choline like substances There was as yet no positive evidence to support a theory of vasomotor disturbance as a causal agency He showed tracings giving evidence of systematic disturbance during a convulsion

Mr G D GREVILLE and Mr TUDOR JONES, Ph D (Runwell), in a paper on water metabolism in essential epilepsy, described the diurnal water exchange in two patients over about four months and in a third patient over one month Similar measurements were made on two non epileptic patients as controls No certain evidence was obtained that the urinary excretion was decreased before a fit and increased afterwards, as has been often claimed The water balance was determined daily The daily excretion of chloride in the urine under constant salt intake at two levels also failed to show any relation to the incidence of fits Serial investigation was also made of the concentration of blood constituents which might be affected by changes in the water content of the organism—plasma protein and non protein nitrogen, haemoglobin and total solids in whole blood Here again the variations were apparently unconnected with the incidence of fits contrary to the findings of other workers

Dr D J WATTERSON (London) described his studies on convulsive phenomena and the effects of cerebral vasodilator drugs Two recent pieces of evidence lent support to the so called vasoconstrictor theory of convulsive states the histological finding that the Cardiazol convulsion in cats is preceded by a generalised or circumscribed narrowing of the cerebral blood-vessels, and the observation that certain drugs which cause cerebral vasodilatation inhibit hypoglycaemic convulsions in dogs and, under certain circumstances, cardiazol convulsion in man Convulsions were induced in guineapigs by the intramuscular injection of cardiazol These closely resemble those produced by intravenous injection, but the convulsive phenomena are spread out over a period of minutes The convulsion is accompanied by a profound fall of pulse rate and change of heart rhythm These events are not associated causally with the convulsion The administration of choline derivatives does not inhibit the convulsions When amyl nitrite is administered, between the time of injection and the point at which convulsive phenomena might be expected, the chance of convulsion occurring is greatly enhanced

Dr A MEYER (London) said it was now widely recognised that the histological changes in idiopathic epilepsy were secondary to the convulsions and not their cause The lesions are due to ischaemic necrosis, and some of them are in characteristic regions Epileptic convulsions set up secondary lesions in the brain which may give rise to mental and neurological disorders The danger is greatest in infancy and early childhood, and W. Scholz has suggested that mental defect and other characteristic infantile conditions may be caused more often than realised by epilepsy The ischaemic changes have been taken as evidence of a vasoconstrictor pathogenesis of the fit Recently Scholz and his collaborators have tried to show by means of a benzidine stain, anaemia of the brain immediately preceding cardiazol convulsions in cats Dr Meyer showed slides suggesting that other than purely vascular conditions must be responsible for the histological changes observed after fits

Mr W GREY WALTER (Bristol) said that the only prominent feature of the normal electro-encephalogram (E E G) is the alpha rhythm, which comes from the parieto occipital cortex and is seen usually only with the eyes shut and the mind at rest The other parts of the brain do not normally produce any regular rhythms In certain neurological conditions, especially cerebral tumour and epilepsy, the affected part of the brain produces slow waves easily distinguished from the normal discharges, these are called delta waves In cerebral tumours, the tissue responsible for the slow discharge is not the tumour itself but the neighbouring cortex, which has been interfered with by the new growth, and there is some indication that the cortex produces delta waves in certain intermediate stages of dystrophy or degeneration, and these are often associated with oedema in the neighbourhood of the tumour It has been found that in "people complaining of fits" whatever the causes may be about 50 per cent show an abnormal E E G, and of those with abnormal records the great majority are clinically idiopathic epileptics, of these the great majority will be under 40 years of age Cases with a well authenticated history of trauma do not usually show any abnormality, it is probable that the slow delta discharge is an indication of fundamental cortical abnormalities which would not be expected in a patient with a splinter of bone or contracting scar causing mechanical cortical irritation In epileptics the abnormality of the E E G is a

continuous delta discharge similar to that found in cerebral tumour, but usually qualitatively different. This discharge goes on continuously and is not affected greatly by the administration or withholding of drugs, although it does show spontaneous fluctuation in size associated with fluctuations in the frequency of fits If the E E.G. is taken during a fit very dramatic changes can be seen. Lennox and his collaborators in Boston distinguish three types of seizure discharge · a smooth slow rhythm of high potential associated with "psychomotor" attacks, a slow rhythm with sharp spikes associated with "petit mal" attacks, and a fast rhythm associated with "grand mal" attacks They have also found, and this has been confirmed by many workers, that in a number of cases "sub-clinical" seizures can be detected by electro-encephalography even when the patient is unaware of the attack; only by careful and continuous observation of the patient's performance of some intricate task can these be detected clinically. The discovery that most young idiopathic epileptics show an abnormal resting E.E.G. can be of great assistance, not only in diagnosis but in prognosis, and in following the results of treatment. It may be said without reservation that a delta discharge in the E E.G. of a patient, complaining of fits or showing a spasmodic behaviour disturbance, is a certain indication that the patient is suffering from, or is likely to suffer from, idiopathic or essential epilepsy, and the prognosis is that associated with this condition Conversely a normal E.E G, although not a certain sign of normality, is suggestive of the possibility of some element other than epilepsy, and the prognosis is correspondingly better than if the E.E.G. is abnormal In a patient in whom hysteria is suspected the diagnosis can be clinched by inducing a fit. If the E E G remains normal the fit is not a true epileptic one.

Mr. N W. DOTT (Edinburgh) gave a general review of the surgical aspects of epilepsy.

Social and Therapeutic Aspects of Epilepsy

Dr J. TYLOR FOX (Lingfield) said that treatment of epileptics should begin at a well-equipped residential neurological centre, whence the cases could be classified into certain broad groups to be dealt with on different lines Epilepsy has grave social implications, and if treatment, in the wider sense, is to be effective, there must be a link between the patient in his home and the physician. Psychiatric social workers are very important in completing the scheme of treatment

Dr G. E. GRAVES PEIRCE (London) discussed the problem of the epileptic in industry

Dr. W. MCCARTAN and Dr. J. CARSON (Haywards Heath) spoke on the use of sodium diphenyl hydantoinate in epilepsy Putnam and Merritt set out to find the ideal anticonvulsant in a large series of animal experiments; they first established the "convulsion threshold" of different animals to electrical stimulation, and then produced variations in this threshold by various methods Of a series of about 100 different chemical compounds, some of them fairly closely related to sodium diphenyl hydantoinate, they found the latter most efficacious, having regard to its high anticonvulsant properties, its comparatively low toxicity and the absence of sedative effect The results of their clinical application of this drug, which has been marketed in the United States under the name of Dilantin, and later in England under the name of Epanutin, have been most encouraging, and the results in the Brighton Mental Hospital correspond, although the time available since the publication of Putnam and Merritt's work has not made it possible to try the drug in a large series of cases or over a long enough period. There is a close chemical relationship between sodium diphenyl hydantoinate and phenyl ethyl hydantoin, otherwise known as Nirvanol. This latter drug has been used in the past in the treatment of epilepsy on the Continent, and more recently in the treatment of chorea Poynton and Schlesinger have described the uses of nirvanol and its toxic effects. Some of the latter correspond with the toxic effects of sodium diphenyl hydantoinin, but no suggestion of the serious blood changes occasionally produced by nirvanol has been found in repeated blood examination of patients treated by epanutin

Dr. C G. MILLMAN reported on five years' experience with Prominal as routine treatment for epileptics The Cell Barnes colony had been opened for the admission of mentally defective patients in March, 1933. Until February, 1934, Luminal had been used in the routine treatment of epilepsy; since then prominal had been used In July, 1937, a report had been published comparing the results of treatment with the two drugs in a series of 39 cases Collectively the number of fits with prominal had been found to be approximately a third of the number with luminal Improvement in behaviour had been noted in many cases Individual results had shown much variation; most of the patients had improved with prominal, some had shown little change, and a few had become worse. Dr. Millman now discussed the subsequent history of those remaining; on the whole, improvement had been maintained Prominal had been used in 154 cases; the records of these had been examined and points of possible interest coordinated Two fatal cases of uræmia possibly due to prominal were reported and subsequent precautions described A case resembling aplastic anæmia developing in a patient under treatment with prominal was described, although the condition was probably coincidental. The effects of substituting soluble phenobarbitone for prominal in 32 low-grade cases were discussed Results of treatment in 16 cases over a period of one year with each drug were shown to be slightly in favour of prominal The economic factor was considered. An attempt was made to define the type of case most suitable for prominal Findings, though equivocal, suggested that high-grade patients with relatively few fits at regular intervals responded most favourably, whereas unsuccessful cases included a number of psychotics The possibility of a classification on therapeutic grounds was suggested.

Dr ISAAC FROST dealt with the use of sodium diphenyl hydantoinate in the treatment of epilepsy, with observations on severe cases After favourable reports had been made by Merritt and Putnam on the use of this drug in convulsive disorders, Dr. Frost had tried it in 12 cases of epilepsy, in which there were 60 to over 1000 major fits a year. Observations so far had extended over two or three months. In 2 cases there had been an apparently complete remission of major attacks, and 2 others had averaged 1–2 fits a month. In 5 others the reduction in the number of fits had been over half. In the remaining 3 cases, though there had been a reduction in the number of attacks, the results had not been striking Previously unrecorded minor toxic symptoms had been noted—e g, epistaxis, nodding of the head, and myoclonic phenomena "Epileptic equivalents" did not seem to be so well controlled by the drug, though in the favourable cases the mental alertness was in great contrast to the dulling effect of the usual anticonvulsants

Prof. F L GOLLA summarised the papers and emphasised the factor of cerebral excitability and its variations in epilepsy

REVIEWS AND NOTICES OF BOOKS

Orthopædic Appliances

By HENRY H JORDAN, M D London Humphrey Milford, Oxford University Press 1939 Pp 412 21s

THIS book ought to be in the hands of the surgeon who is inaugurating or in charge of a splint workshop, as well as accessible to the head mechanic, for it gives minute and practical details of the construction of every important piece of apparatus These are illustrated by first class photographs and line drawings The author uses great judgment in his selection of apparatus, he has drawn his ideas from both sides of the Atlantic, and has added ingenious designs In a foreword Dr E G Brackett agrees with the author that the proper selection and final adjustment of an appliance are as essential as is the detail of the operative treatment, and that knowledge, skill and personal supervision are required for its proper use If this book induces its readers to give more attention to acquiring such skill it will have benefited an enormous number of patients

In the section on spines, the author rightly stresses the difficulties of supporting this complex and mobile region of the anatomy He points out how essential it is to prepare a plaster of paris model of the trunk, on which to construct the apparatus, such a model being made and adjusted by the surgeon, who alone can judge its fundamental features In Britain this stage is often left to brace makers, nurses, or inexperienced residents The designing of such a brace demands constructive thought, as well as good judgment and skilled workmanship He divides spinal supports into supporting and corrective, but agrees that there is a very limited field indeed for the latter, as practically all correction should have been completed before a removable brace is prescribed Further, rigid supports are more comfortable than flexible ones He stresses the important principle of 3 point pressure for nearly all braces, all trunk apparatus must take its base on a well fitted "pelvic cage" He does not recommend the celluloid corset, which seems so popular in spite of its essential weakness and lack of adjustability He illustrates and recommends a number of Hohmann's ingenious devices, which are not easily accessible to the English speaking surgeon, and therefore are not as widely used as they should be These include the cork and celluloid buttress, which has revolutionised the treatment of neglected kypho scoliosis, the spiral iron for lower limb apparatus, including the valuable club foot type, and some for the upper limb

The author insists on a point which the professional instrument maker is loth to recognise—namely, that the introduction of joints into apparatus adds greatly to its weight and only in exceptional cases has compensating advantages The importance of controlling the trunk when fitting shoulder abduction splints is noted, a thing commonly neglected, and the author illustrates an effective and simple piece of apparatus of his own design for traction on the upper arm There is also a clear description of simple knee and ankle supports of leather, made on the principle of the many tailed bandage

In a book of this size from the U S A one would have expected an account of Goldthwait's various simple and extremely valuable spinal supports yet the author entirely ignores them Can it be that the city of Boston has not been heard of in New York? There are some smaller omissions of useful devices that might well be included in a later edition Among these are the "banjo" traction splint for stiff fingers, which proved so valuable in the late war, a grid over a radiator for drying plaster of-paris casts, and a blacksmith's tongs for spreading open a cut plaster before removal and for moulding in turned edges

The Chemistry of Milk

(2nd ed) By W L DAVIES, Ph D Camb, D Sc Wales, F I C, research dairy chemist and analyst, National Institute for Research in Dairying, Shinfield, Nr Reading, assistant for research in dairy chemistry, University of Reading London Chapman and Hall 1939 Pp 531 25s

GROWING realisation of the unique importance of milk and its products in human nutrition has led to increasing interest in its fundamental chemical and biochemical problems The new edition of this book gives an up to date and complete account of most aspects of this general theme Though new information has been incorporated where necessary, the author does not always give the latest available information on the chemistry of some of the minor constituents of milk, for example, in the case of vitamin B_1 The introduction of a paragraph on the hormonal control of milk composition is welcome, but recent work might have been more fully considered The section which will probably be of most interest to medical readers is that which deals with the nutritional value of milk This describes recent work on the thorny question of the effect of pasteurisation on the value of milk as a food

Unfortunately the book is still marred by frequent infelicities of English, such as, "This *period* of rapid oxygen-absorption is contemporaneous with the *region* of tallowiness" (our italics) Sometimes the writer's meaning is obscure, as in the following "The presence of olein acid makes the fractional crystallisation of the lower acids difficult and so is used only when an estimate of the higher saturated fatty acids is needed" Also authors' initials might have been given in the bibliographies which follow each chapter, and more care taken in compiling the author index Apart from these blemishes, which may readily be remedied in the next edition, the book can be strongly recommended as an authoritative and comprehensive account of the subject

Annual Review of Physiology

By JAMES MURRAY LUCK, editor and VICTOR E HALL, associate editor California Annual Reviews, Stanford University 1939 Pp 705 $5

THE volume of physiological "literature" which appears month by month has been sufficiently deplored, to describe it again would be to waste superlatives Let us admit at once that the title of this review is heroic and the conception admirable The result is a partial solution to the problem of the harassed scientist confronted with a menacing flood of print While some may be harassed more by the mental picture of themselves drowning in this flood than as a result of actually taking arms against a sea of troubles it cannot be denied that the problem exists Physiologists may already congratulate themselves on having at their service a comprehensive series of abstracts in German, brief abstracts in at least two English journals and two well known and other less known review journals Now this annual review appears which differs from the others in being

committed to survey recent work in every branch of physiology at one- or two-yearly intervals

The book will be of greatest use to the physiologist in his rôle of teacher. Most investigators find little difficulty in keeping up to date in their own field and would not be helped materially by these brief reviews which, though thorough, are not all comprehensive. But the editors hope, by changing the authors, to vary the approach to the different subjects—there are 24 sections, each by a different author—so that with the passage of time the series on any one topic will become increasingly valuable. In ten years' time they may be a godsend to the new research-worker Meanwhile it is not going too far to suggest that it is the duty of all who teach physiology to read the greater part of this book in order to acquaint themselves with progress in lines other than those which specially interest them. Sections on such subjects as radiation, genetics, developmental physiology, anæsthesia and physiological psychology look strange to English eyes (though one of them is written by an Englishman), but present boundaries have been determined largely by tradition and we can no longer afford to neglect advances in closely related fields.

The reader will encounter a variety of styles, ranging from Gesell's dramatic presentation of respiration and its control, to the skilful mosaic of Evans on endocrine glands, and the monotone of Bozler on muscle. The lasting value of the book will depend more on its successors than on itself. It is a good beginning.

A Bibliography of the Writings of Harvey Cushing

Prepared on the occasion of his seventieth birthday, April 8, 1939, by the Harvey Cushing Society. Springfield: Charles C. Thomas. 1939. Pp. 108. $5.

It is seldom that the writings of a medical man are sufficiently numerous to enable his admirers to prepare a Festschrift of this character. We have here the imposing total of 13 books and monographs and 306 papers In addition there is a list of 328 papers from Dr. Cushing's clinics and laboratories. Notes are appended to many of the entries explaining the occasions of addresses and lectures, and appraising the larger works

In a happily phrased foreword, Dr Arnold Klebs speaks of the functions of birthday cakes and explains the suitability of the present volume as a substitute This elegant tribute to a great man is limited to 400 copies

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British Journal of Surgery

THE July issue contains the following articles:—

INCREASED and DECREASED DENSITY OF BONE, WITH SPECIAL REFERENCE TO FIBROSIS OF THE MARROW By H. A. T. Fairbank (London). Osteoporosis and osteopetrosis may be associated, or one may follow the other, in an individual case The common factor of fibrosis of the marrow is traced in various bone diseases Parathyroid dysfunction is suggested as the cause of renal rickets and of "marble bones"

IMPROVED SPINAL ANALGESIA. By Graham MacPherson (Hull). Light Percaine solution (1 in 1500 in ½ per cent saline) is the author's choice. He describes the technique he has used successfully in 513 cases and marshals his arguments in favour of percaine and of the use of a hypobaric solution

THE TREATMENT OF EMPYEMA THORACIS BY HIGH NEGATIVE-PRESSURE DRAINAGE By E R Trethewie (Melbourne). A historical survey of the treatment of empyema is followed by a discussion of the great advantages of closed drainage and of negative pressure. Eighteen patients on whom the author's method was employed all recovered.

VERITOL. A BLOOD-PRESSURE STIMULANT FOR USE DURING AND AFTER OPERATIONS. By Harold Dodd and Gerald Merton (London). From experience of its use in forty major surgical cases the conclusion has been reached that veritol is a reliable and satisfactory drug for restoring blood-pressure. Its action is transitory.

SPONTANEOUS RUPTURE OF THE GALL-BLADDER, WITH MASSIVE INTRAPERITONEAL HÆMORRHAGE. By Robert Mailer (Glasgow) At operation blood was found oozing from a rent in the gall-bladder adjacent to the liver From the absence of bacterial inflammatory change in this case and in 30 other acutely inflamed gall bladders examined the conclusion is drawn that the vascular changes associated with impaction of the stone are the most important.

VASCULAR ANOMALIES OF THE UPPER LIMBS ASSOCIATED WITH CERVICAL RIBS. By R M Hill (Keighley) Report of a case in which removal of the rib and of a fibro muscular band relieved pain, with diminution of swelling and improvement in the colour changes of the hand.

THE VASCULAR COMPLICATIONS OF CERVICAL RIBS AND FIRST THORACIC RIB ABNORMALITIES. By K. C Eden (London) Three cases are reported, two treated by excision of the cervical rib, and one by excision of part of the first rib. The vascular changes are said to be due to damage to the wall of the subclavian artery by intermittent pressure.

SUBLINGUAL DERMOIDS By Hamilton Bailey (London) The swelling occurs above or below the mylohyoid, and in either a median or a lateral position. Removal by incision below the angle of the jaw is advocated.

A CASE OF COLOCOLIC INTUSSUSCEPTION DUE TO DYSENTERIC ULCERATION. By Major F M. Collins (Vizagapatam). The patient, an emaciated Indian, had recurrent colic, with two attacks of acute dysentery He died after resection

SPONDYLOLISTHESIS By Wilfred Kark (Pontefract) In the case reported injury occurred eleven days before the radiogram was taken revealing the displacement. Reduction was effected by a combination of slinging the trunk in semiflexion with application of weight extension to the lower limbs.

THE SUPPORT OF THE SHOULDER: A NEW ABDUCTION SPLINT By W A Cochrane (Edinburgh). The body portion of the splint is a modification of the Goldthwait spinal brace. The abducted arm rests upon a supporting base formed by the pelvis and spine

SUCCESSFUL IMPLANTATION OF CUT PANCREATIC DUCT INTO THE DUODENUM. By D. J. Harries (Cardiff) The duct was cut during the freeing of the posterior surface of the stomach in a very difficult gastrectomy There were no complications from the anastomosis

CONGENITAL ABSENCE OF THE RIGHT FEMUR By Kamalakar Manohar (Bombay). Rudiments of the upper and lower ends were present, but neither hip-joint nor knee-joint A complete description is given of the anatomical findings at necropsy.

CONGENITAL DEFECT OF THE SHAFT OF THE FEMUR By H. H. Langston (Alton). Three cases are described of a congenital deformity due to retardation of ossification of the upper half of the femur. The condition is often associated with absence of the fibula and with bowing of the tibia The treatment is discussed

GALL-STONES AND CANCER: A PROBLEM OF ÆTIOLOGY, WITH SPECIAL REFERENCE TO THE RÔLE OF IRRITATION By Harold Burrows (London) Gall-stones from non cancerous patients were introduced into the gall bladder of 33 guineapigs. In 18 others various foreign bodies were introduced in combination with cholesterol or with carcinogenic agents. All the animals were allowed to die natural deaths and lived from 9–359 weeks None developed cancer. It is concluded that chronic irritation is not the cause of cancer of the gall-bladder

The issue contains an appreciation of the late Charles Herbert Fagge, and there are also short notes of rare or obscure cases.

CONTROL OF THE COMMON FEVERS

ERYSIPELAS

Reviewed by DR THOMAS ANDERSON, *deputy physician-superintendent of Ruchill Fever Hospital, Glasgow*

THREE years have now elapsed since Prontosil Rubrum (sulphamidochrysoidine) was first used in this country in the treatment of erysipelas The time is not unsuited, therefore, for a critical assessment of some of the factors involved in the control of this common disease

The clinical appearance of a case of erysipelas is too well known to require repetition here Comment may, however, be made on one point Formerly the condition was classified as either idiopathic or traumatic according to the absence or presence respectively of an obvious focus for the entrance of the infection Recently the knowledge of the bacterial origin of the disease has led to the assumption that all cases are traumatic in the sense that there must be a focus of origin, which might, however, be microscopic Although this observation is correct in lesions involving the limbs and trunk, it is not true of those involving the face, where most of the idiopathic lesions are seen Careful history taking in such cases reveals that in many of them the onset of erysipelas is preceded by a definite infection of the upper respiratory tract, tonsillitis, pharyngitis, and rhinitis, not infrequently accompanied by epistaxis, may be present for a period up to ten days before the dermatitis appears This fact has not received the prominence which it deserves, although it has been mentioned by some writers (Keefer and Spink 1936, Benson 1938) The explanation of this may be that only those cases which occur in surgical wards are usually transferred to fever hospitals, in Glasgow some 50–60 per cent of all notified cases are removed to one fever hospital. Under these conditions a considerable number of true idiopathic cases are constantly observed. In a disease whose clinical features are often upset by the presence of some complicating factor—infective, degenerative, or metabolic—the use of the term "idiopathic" to describe cases in which the onset is marked by an early acute inflammation of the upper respiratory tract separates a group more amenable to clinical comparison and bacteriological study

Bacteriology.—That erysipelas is a streptococcal infection is no longer in doubt Much labour has been expended in an attempt to prove that a specific streptococcus is responsible for it Most workers, however, now agree that the same streptococcus can be responsible for various diseases, and Okell (1932), producing case records to show the protean clinical manifestations of the same infecting agent, supports this so called "unitarian" hypothesis

The classification of strains from erysipelas by Lancefield's precipitin test or by Griffith's serological method has not been extensively practised The organisms are usually of Lancefield's group A (human) although Griffiths (1934) refers to a type VII strain as belonging to group C The occurrence of erysipelas in contacts of definite cases of scarlet fever and its association with this disease in small epidemics make it extremely unlikely, however, that there is any essential difference between the streptococci which cause the two diseases

Control.—Since erysipelas of trunk and limbs may be regarded as traumatic in origin and erysipelas of the face, when not traumatic, is usually due to infection of the upper respiratory tract, control is limited to treatment of the fully established disease and to prevention of recurrence (as distinct from reinfection)

RELAPSE AND RECURRENCE

An interesting feature of erysipelas which has defied an exact explanation is the relapse or recurrence so often seen Keefer and Spink (1936, 1937), Gay and Rhodes (1922), and Dochez and Stevens (1927) explain it by showing that after the primary attack the skin remains hypersensitive to the streptococcus or its bacterial products Keefer and Spink report a case in which a typical recurrence resulted after the injection, at some distance from the original lesion, of a toxic filtrate from the patient's own streptococcus Amoss (1931), commenting on the difficulty of isolating the infecting strain from recurrent cases, also suggests that second attacks may be due to bacterial products draining through the skin rather than to a fresh invasion Benson (1938) alludes to the possibility of septic foci remaining in the associated glands and paranasal sinuses as a cause of recurrence Up to the present, however, there has been no evidence to show whether the infecting strain of streptococcus in the recurrence is serologically the same as or different from that of the primary attack In this respect the absence of recurrence in cases receiving sulphamidochrysoidine or its congeners is, perhaps, a material fact Previously a direct antibacterial therapeutic approach was lacking Attenuated or degraded streptococci might remain in the tissues after the primary attack and be responsible for the recurrence During the course of an extensive investigation of the value of chemotherapy with these new drugs I noted that the proportion of patients admitted who had previously had an attack of erysipelas had progressively diminished throughout the period of the experiment (table I) The investigation was carried out in three consecutive series In the first and second every alternate case received treatment with sulphamidochrysoidine or its derivative, sulphanilamide, in the third all cases were so treated Table I shows a gradual fall in

TABLE I—RECURRENCE OF ERYSIPELAS

Series	Number of cases studied	Percentage of cases in which the patient had had a previous attack
1	312	23·6
2	270	19·3
3	242	15·6

the percentage of recurrent attacks during the period when an increasing number of patients were receiving the drugs The figures support the view that recurrence may arise from bacteria remaining in the tissues after the primary attack of erysipelas It is important in this respect to distinguish between reinfection and true recurrence A patient with a fungating cancer-oma or a chronic discharging sinus is constantly susceptible to a reinfection of the open site with haemolytic streptococci It is unlikely that any treatment could protect such a person from a repetition of the attack of erysipelas It seems, however, that with the new methods of treatment the recurrence previously so common in idiopathic erysipelas, is

one of the features of the disease which is now under control

PROGNOSIS

One of the difficulties is that there is no method of assessing the severity of erysipelas clinically. In some patients, despite an exceedingly angry-looking local lesion with moderate pyrexia, there is practically no other evidence of toxæmia; in others the local lesion appears to have little activity, although there is a high pyrexia with a severe toxæmia. Such variations are only seen when many cases can be reviewed by the same observer, and they demonstrate the difficulty of prognosis in each case

A further difficulty is that in an appreciable percentage of cases, although the initial efflorescence of the lesion in the first twelve to twenty-four hours may be active and rapid, the infection seems, in this short period, to reach the limits of spread. In such cases, despite the angry appearance of the lesion when first seen by the physician, further spread will not take place. There is unfortunately no method of foretelling when this will happen. In a recent series studied clinically, for the purposes of a therapeutic experiment, every third case admitted to the erysipelas wards received initially powders containing sugar of milk. In some of these cases the results of such treatment were recorded as "excellent." Spread of the lesion had ceased within twenty-four hours of admission in 35 per cent; and nearly 38 per cent. were afebrile after forty-eight hours in hospital. (These results do not merely represent the proportion of mild cases coming into hospital; some were assessed on admission as "severe" and many as "moderately ill") These figures demonstrate that the assessment of the value of any treatment is exceedingly difficult, and that any report suggesting that a certain therapeutic measure is efficacious must satisfy the following criteria: (1) the number of patients treated must be large; (2) there must be no selection of cases for treatment, all cases being included in the series studied, and (3) an alternative method of treatment must be used and patients entered to the two groups strictly in order of admission. Finally, when the results are assessed, it must be remembered that probably a third of the cases would have shown spontaneous cure in respect of spread of lesion and pyrexia within twenty-four to forty-eight hours of the start of treatment

TREATMENT

Although the easy recognisability and the fact that its course can be followed from day to day seem to make erysipelas an especially suitable disease for the study of the therapeutic efficiency, in man, of different methods of antistreptococcal treatment, certain points must be borne in mind. In streptococcal infections two main features may be noted: a toxæmia due to a diffusible exotoxin, the other due to that invasiveness which is a feature of the streptococcus. Longcope (1938) suggests that the variety, special character, severity, and outcome of hæmolytic streptococcal infections are determined by the predominance of one or other of the biologic properties of the particular infecting organisms and by the interaction of these forces on the varying resistance, immunity, susceptibility, or allergy of the host. In scarlet fever, for example, the early toxæmia and rash are due to circulating toxins, and some of the complications, such as suppurative adenitis, are due to invasion by the bacteria In erysipelas, on the other hand, the infection is dangerous by reason of its invasiveness into the tissues or blood-stream Birkhaug (1927), introducing anti toxic treatment, suggested that the results of his experiments presented a striking parallel with those reported by Dick and Dick in scarlet fever. Francis (1928) pointed out that on clinical grounds there was little reason for suggesting such a parallelism A comparison of the age-incidence in the two diseases alone suggests that the factors operative in them are not similar. The adoption of the "unitarian" view regarding the bacterial origin of the streptococcal infections has tended to involve a unitarian approach in regard to their treatment. There is reason for suggesting that treatment, to be effective, must be aimed at the particular feature of the infection which is uppermost, and, a priori, there is good ground for believing that scarlet fever and erysipelas, differing so much in their clinical features and pathogenesis, would not be amenable to similar methods of treatment

A review of the published reports of the treatment of erysipelas is not encouraging. One feels that to claim efficacy for a new method of treatment requires some audacity. No longer ago than 1928, Symmers claimed that the introduction of specific antitoxic treatment in erysipelas marked an advance whose results were only commensurate with those obtained by the antitoxic treatment of diphtheria. Parish and Okell (1928) showed that hæmolytic streptococci from various sources produced similar lesions when injected intradermally in rabbits, and they suggested that all hæmolytic streptococci were identical in their toxic action They further suggested that a single antitoxin (scarlet-fever antitoxin) could effectively neutralise this single toxin. It would be anticipated therefore that the therapeutic efficacy of "specific erysipelas" antitoxin and scarlet-fever antitoxin would be similar. The following experience does not appear to confirm Symmers's optimistic prediction.

TABLE II—RESULTS OF TREATMENT BY VARIOUS METHODS OF CASES JUDGED AS "VERY SEVERE"

Group	Method of treatment	Factor of assessment	Duration in days of spread of lesion and of primary pyrexia						Total cases in group
			0	1	2	3	4	5+	
1	Sulphamido-chrysoidine	Spread	7	6	3	2	1	0	19
		Primary pyrexia	0	4	6	5	1	3	
2	Ultraviolet light	Spread	0	2	5	2	2	4	15
		Primary pyrexia	0	0	1	1	4	9	
3	Sulphamido-chrysoidine+ ultraviolet light	Spread	1	4	3	0	0	0	8
		Primary pyrexia	0	2	1	2	0	3	
4	Scarlet-fever antitoxin	Spread	0	1	0	3	2	1	7
		Primary pyrexia	0	0	0	0	0	7	

Note—In the original investigation from which these figures are taken the number of cases in groups 1 and 2 was double that in groups 3 and 4

In a preliminary series of 312 cases treated, strictly in order of admission, with sulphamidochrysoidine, ultraviolet light, a combination of these two treatments, or scarlet-fever antitoxin it was noted that 19 had been classified by me as "very severe" on admission to hospital (Snodgrass and Anderson 1937a). A separate analysis of these cases (table II) shows that those treated with antitoxin gave the worst results

Colebrook (1935) suggested that patients with puerperal fever treated with scarlet-fever antitoxin did badly Later Kenny and Colebrook (1937) showed that most patients with puerperal fever

reacted negatively to the Dick test Many observers have noted that in erysipelas the Dick test is usually negative Since scarlet fever antitoxin is mainly if not entirely anti-erythrogenic, it seems that its administration to persons insusceptible to the toxin (as judged by the result of a Dick test) is unlikely to be beneficial

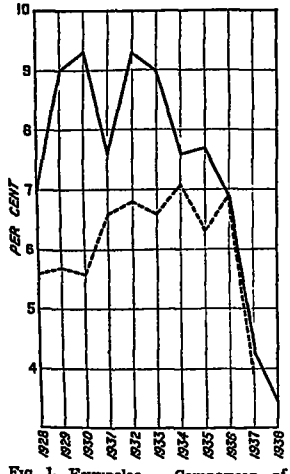

FIG 1—Erysipelas Comparison of death rate for England and Wales (interrupted line), calculated from the Registrar General's (England and Wales) Statistical Review, 1937, Part I, Medical, and case mortality in Ruchill fever hospital (continuous line)

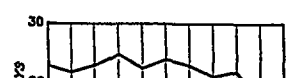

FIG 2—Average days' residence of erysipelas patients in Ruchill fever hospital during the same years

Chemotherapy with one or other of the sulphonamides has been extensively reported The great majority of these reports are in favour of the value of the drugs Few of them, however, satisfy the criteria enumerated above In fact in only two series of cases outside Great Britain has the number exceeded 100, and an alternative and concurrent control has usually been neglected Studies of 824 consecutive cases have been reported from Ruchill fever hospital (Snodgrass and Anderson 1937a and b, Snodgrass, Anderson, and Rennie 1938), and a summary of these results is shown in table III The figures leave little doubt of the efficacy of the new treatment

It has been suggested, however, that in the years preceding the introduction of sulphamidochrysoidine there had been a gradual decrease in the virulence of streptococcal infections, and that only part of the success of the new chemotherapy is due directly to the action of the drugs Fig 1 has therefore been prepared in an attempt to view the matter more objectively The graph shows that there has been so far as erysipelas is concerned, no obvious change in the case mortality for Ruchill fever hospital or in the death rate for England and Wales during the period 1928-36 The latter in fact suggests that there was a gradual though slight increase in the severity of the disease up to and including 1936 The drop in the 1936 case mortality at Ruchill is explained by the fact that from May, 1936, half the patients received sulphamidochrysoidine, though in rather small dosage These curves may be read in conjunction with that showing the average days' residence of patients with erysipelas in Ruchill during the same period (fig 2) (The average days' residence of patients in a fever hospital is not unsuitable figure for measuring the severity of a disease The constant demand for beds and the lack of visitation by relations make it certain that the patient is dismissed as soon as possible) There appears to be a close similarity between the three curves Such change as has taken place seems to have followed the introduction of the sulphonamide drugs and not to have preceded it There seem to be, therefore, reasonable grounds for presuming that the control of erysipelas by effective treatment is now an accomplished fact

TABLE III—RESULTS OF TREATMENT OF 824 CASES OF ERYSIPELAS

—	Cases treated by control methods	Cases treated with sulphanil amide or related compound
Percentage showing no spread after 24 hours in hospital	67 2	86 2
Percentage showing cessation of primary pyrexia within 48 hours of admission to hospital	50 3	75 5
Case mortality per cent	5·0*	2 8

* It should be noted that having proved in the first series of 312 cases that sulphamidochrysoidine was of value in the treatment of erysipelas thereafter patients responding badly to the control methods of treatment received a sulphonamide compound

Adequate chemotherapy cures erysipelas in practically all cases within three or four days The three preparations which have been most extensively used are prontosil rubrum (sulphamidochrysoidine), Rubiazol (carboxysulphamidochrysoidine) and *p*-aminobenzenesulphonamide The last mentioned drug is properly referred to as sulphanilamide, although it is often designated by different trade names

TABLE IV—DOSAGE OF SULPHONAMIDES IN ERYSIPELAS

Age group	Dosage in grammes per 24 hours		
	Sulphamido chrysoidine	Carboxy sulphamido chrysoidine	Sulphanil amide
Adults	9–12	2–3	6–9
5–10 years	6–9	1–2	4 5–6
Under 5 years	3–6	0 5–1	3

Table IV shows the range of dosage which should be employed in different age groups Children tolerate the drugs exceedingly well, and, since the disease is often most severe in infancy, relatively large doses may be administered, especially in the early stage of treatment To maintain an effective concentration of the substance in the blood, the drug should be given by mouth at four hourly intervals Preparations may be obtained for parenteral administration but show no therapeutic advantage over the oral route

If the suggested dosage is used the lesion will cease to spread within forty eight hours, and in most cases the temperature will return to normal within three or four days of the start of therapy Should this not happen, the diagnosis should be reviewed, the presence of some septic complication should be excluded and the question of fever directly due to the drug should be considered Full dosage should

be used until the temperature returns to normal, after which the drugs should be continued in a dose of 0·5–1 g. thrice daily for ten to fourteen days. When this is done, recurrence of the disease is unusual.

Finally, during the administration of these drugs certain rules should be rigidly applied (Snodgrass and Anderson 1937b) In such circumstances the toxic effects of the drug will be minimal. Reference should be made to the original papers for information about the toxic effects usually encountered.

CONCLUSION

In the present stage of knowledge the control of erysipelas depends on the adequate treatment of the infected patient with one of the sulphonamides. In such circumstances relapse and recurrence will become less frequent, although reinfection will not be prevented.

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MEDICINE AND THE LAW

Police Complaint of Panel Doctor

THE Derby insurance committee last week disposed of what seems a novel point of panel practice The chief constable had formally complained of the conduct of a doctor in circumstances to which he took "strong exception." A man who was on the doctor's panel had been found dead. The police had informed the doctor by telephone, and at the request of the widow had asked him to call The doctor, it was said, had replied "I will call on my morning round You have a police surgeon; make use of him; I will give him all the assistance I can regarding the man's medical history" The complaint was referred to a subcommittee, to which the doctor gave a slightly different version of the facts The police, he stated, asked him to come round at once to pronounce life extinct, although they assured him that the man was dead and had been dead for some time before he was found. As nothing more could be done for the patient, he promised to call next morning to see the widow and to give his opinion on the cause of death; he did so and gave the police all the information he possessed He maintained that he was under no obligation to visit anybody at the request of the police, even if they guaranteed his fee As regards his duties under the terms of service, he always understood that death put an end to the patient's insurance.

Misunderstanding is always possible in telephone communications An insurance practitioner would presumably be right in challenging the authority of the police to summon him to view the body of a panel patient who had been dead for several hours On the other hand he would feel obliged to attend if the patient's wife sent for him because her husband was in extremis The chief constable told the sub committee that the doctor was wanted, on behalf of the widow, to examine the body because the police had no authority to pronounce a man dead The police sergeant who had sent the telephone message gave evidence that he told the doctor he was speaking for the widow On the other hand the doctor said that he did not understand that the police were calling him on the widow's behalf; that was why he suggested making use of the police surgeon if the case was urgent. The subcommittee's report seems to have supported the doctor's attitude The insurance committee, adopting the subcommittee's findings, decided to take no action in a matter which they considered to be outside their jurisdiction They decided that the doctor had not committed a breach of the terms of service.

Slander of a Medical Officer

If medical officers of health inevitably encounter hostility in the discharge of their duties, they ought at least to be protected from a campaign of abuse In a case recently heard in Dublin Dr. D. McCarthy, formerly county medical officer of health for North Tipperary, recovered substantial damages for defamation from Mr. Daniel Morrissey, who had accused him of furnishing a false report to the local authority. Dr. McCarthy was responsible to the North Tipperary board of health for the health and cleanliness of children attending elementary schools in the board's area. In March, 1938, he and his assistants examined the children attending the convent girls' school at Nenagh, and he forwarded his report to the board. He complained that in the following month the defendant declared on several occasions that the report was absolutely untrue "I know," the defendant was alleged to have said, "that there are children going to school who received a 'yellow ticket,' classifying them as dirty, but there were no cleaner children to be found in Nenagh, in Tipperary or in Ireland" The defendant, as a member of the Nenagh urban district council, moved a resolution strongly protesting against Dr McCarthy's report as "a scandalous reflection on the town and a gross slander on the mothers and teachers of the children of Nenagh" Dr. McCarthy contended that these words imputed impropriety, misconduct or incapacity to him in the discharge of his profession and his office, and he pleaded further that, owing to the slander, he had been unable properly to perform the duties of his office and was forced to resign it The defendant pleaded all the defences usual in such proceedings—denial that he spoke the works, denial of publication, denial that the words were defamatory, privilege as a district councillor, honest belief in the truth of the statements, and fair comment on a matter of public interest He also contended that the allegations were in fact true

Mr Justice Hanna upheld the plea of privilege in respect of one of the occasions when the words were uttered, but not in respect of another occasion The jury found in favour of Dr. McCarthy and assessed the damages at £600. The plaintiff's position as medical officer of health had clearly been made impossible and he is to be congratulated on the vindication of his character. A public servant who must report only what is palatable would be of little use to the community.

THE LANCET

LONDON SATURDAY, JULY 29, 1939

TOWARDS MENTAL WELFARE

THE best preparation of a people for peace or war must be soundness of body and mind In these days of suspended crisis much attention has rightly been devoted to the body, and the organisations that aim at promoting physical health are busily engaged in coördinating their efforts and making their schemes part and parcel of the educational system The physical fitness campaign may be regarded as the third stage in a movement which had its origin in the sanitary efforts of the pioneers of the nineteenth century and led on to the preventive medicine triumphs of the twentieth But physical fitness alone is a barren ideal it can bear no fruit unless it is mated with intellectual fitness This fact, too, is at last gaining recognition, but although mental health has become an object of public concern, there is as yet no single efficient organisation for turning this concern to practical ends Efficient and valuable organisations there undoubtedly are, but these have not been fully coordinated or their resources concentrated where most needed We have depended too long on the generosity of the Commonwealth Fund of America in carrying out functions that are our elementary duties as a nation Much of the work in this field has been done by voluntary bodies, so it was appropriate that they should take the initiative in establishing "a single directive force to guide the development of the service and to lay plans for future action on a united front" The committee which has met under the chairmanship of the Earl of FEVERSHAM has wisely gone beyond the immediate domestic matter of coordination or fusion, and has reviewed the whole problem of mental health in this country Its report is a pathetic record of our failure to undertake one of our most urgent social obligations The lack of an organised mental health service is serious enough in peace time, in times of stress it is a public danger of the first order

The clear and balanced report, of which a brief summary is given on p 274, deals comprehensively with this tangled subject It will be appreciated by all who have complained of the difficulty of seeing the wood for the trees The trees are indeed varied, some stubborn and gnarled, others luxuriant and even rank, with their interlacing roots and struggles for light and nourishment, leading to an obvious ecological problem The solution of this problem—how all the necessary kinds of psychiatric activity are to live together harmoniously—has been the chief business of the committee Seeing the matter as a whole, they can propose measures which take account of the public services of the Government or local authorities, and of the essential, if at present supplementary, services rendered by voluntary bodies There is a clear case for the amalgamation of the existing voluntary associations—the Mental After-Care Association, the Central Association for Mental Welfare, the Child Guidance Council, and the National Committee of Mental Hygiene The first of these bodies has declined to merge itself in the proposed National Council for Mental Health, but this has not hindered the Feversham committee from putting forward the general plan There is no aspect of mental health work which has not been touched on in the report, though administrative questions have received more attention than research, teaching, and clinical principles, all of which are fundamental to the developments foreseen

The recommendations cover a wide range Mental deficiency is an instance in which big alterations are recommended The experts will warmly support them It is proposed that the Mental Deficiency Acts should omit references to educational incapacity and adopt the criterion of social inefficiency, educational retardation being left to be dealt with under the Education Act, it is urged that defectives, like the mentally disordered, should be able to obtain institutional treatment voluntarily, and that the procedure for guardianship should be simplified and made less formal Welcome emphasis is placed on social aspects in the four chapters dealing with mental disorder, mental deficiency, delinquency and the mental health of children Few people who are not psychiatrists recognise how indispensable to efficient work in any of these fields is the psychiatric social worker, whose training and equipment are now highly specialised It is anticipated in the report that the demand for trained social workers will presently far exceed the supply, and it is therefore urged that similar courses to that provided by the London School of Economics should be arranged at the great teaching centres

Perhaps the most interesting recommendation of the committee is its advocacy of psychiatric clinics with inpatient and outpatient facilities In populous areas these would be special hospitals, and in smaller centres special blocks adjacent to the general hospitals Where a medical school is within reach, the special psychiatric hospital for early mental and "functional" nervous disorders should be established in close association with it There should, in short, be hospitals on the model already familiar in some university centres in the United States and on the Continent and in England represented by the Maudsley Hospital Such hospitals, in each of the university centres, would provide teaching facilities for medical men and psychiatric social workers, and in many ways would advance psychiatry throughout the country There would be, as the committee points out, close coöperation between the special psychiatric hospital on the one hand, and the mental and general hospitals on the other Grouping of mental health work on a regional basis, as is done with other branches of public health, and adjustment of the boundary between statutory and

voluntary activity, with greater cooperation between them, are obvious needs which the report puts with convincing objectivity. In its combination of enthusiasm for the main end and detachment from rivalries and partisan claims it is a document of great value, which will be of historic importance in the growth of the mental health services of this country.

ACTIVITY OF GONADOTROPHIC PREPARATIONS

ONE of the chief obstacles to the clinical use of gonadotrophic substances is the difficulty of securing accurate information about their biological effects in women. Much of the information on which therapy must be based has to be obtained from laboratory animals, and its value is greatly reduced because the response to gonadotrophic substances differs widely from species to species: what is true of one animal is not necessarily true of another—or of the human patient. This variation between species is, at least partly, attributable to the fact that the response of the gonads to gonadotrophic substances is sometimes modified by the concurrent activity of the animal's own pituitary, especially where the initial changes in the ovary, or the extract itself, stimulate pituitary secretion. Writing in the first issue of the new *Journal of Endocrinology*, NOBLE, ROWLANDS, WARWICK and WILLIAMS [1] take it as proved that the apparent response of the ovary of the immature rat to the gonadotrophic substance of human urine of pregnancy is largely caused by the hormones of the rat's own pituitary. In the intact immature female rat the ovary responds by enlargement of follicles (which may be followed by ovulation), and the formation of normal or atretic corpora lutea, or sometimes blood follicles. On the other hand, in immature rats deprived of their pituitary the only change in the ovary evoked by chorionic gonadotrophin is a diffuse luteinisation of the stromal and thecal tissue. This suggests that human urine of pregnancy contains but a single gonadotrophic substance, with a luteinising action; whereas, without experiments on hypophysectomised animals it would naturally be deduced that such urine has both follicle-stimulating and luteinising activity.

No-one can yet say how far the endogenous gonadotrophic hormones contribute to whatever effects follow the administration of gonadotrophic substances to women in whom there is reason to suspect hypogonadotrophism. It is unlikely, however, that the participation of the intact pituitary gland is as important in women as in rats. Information more relevant for clinical purposes might therefore be obtained by using experimental animals in which the pituitary has little influence. For this reason, as well as because of their blood-relationship to us, one would expect to get the most valuable information from a study of the effect of gonadotrophic preparations on monkeys, in which tests carried out on intact immature females have yielded little evidence of interference by the pituitary body. In a paper just published DE FREMERY [2] not only summarises existing information for this class of animals, but adds new and significant data. He has compared the effects on the ovary of immature macaque monkeys of gonadotrophic extracts from the pituitary of pigs and of human beings, from human placentas, from human urine of pregnancy and from human urine during the menopause. Of these various preparations the chorionic gonadotrophin was found to have no obvious action in the dosage used, and it seems therefore that in macaques, and possibly in all primates, this type of gonadotrophic preparation has no power to cause direct enlargement of the graafian follicle. Exactly the same lack of response was seen when extracts of human placenta were used—a result which supports the view that the substances of human urine of pregnancy and of human placenta are identical. Extracts from urine of the menopause stimulated the follicle slightly. With extracts of pig pituitary, however, strong stimulation of the follicle was observed; and there was no luteinisation, which is interesting because luteinisation is the chief effect of a pig-pituitary extract on the immature rat, or even the hypophysectomised rat. The effects of pig-pituitary extracts in monkeys further differed from those in rats in that the effectiveness of the extract was not increased by the simultaneous administration of chorionic gonadotrophin or by the Maxwell technique (admixture of zinc sulphate). Extracts of human pituitary gave intense follicle-stimulation, and it is noteworthy that the human pituitary, tested on monkeys as on rats, has a greater content of gonadotrophic material (per mg. of dried tissue) than the pituitary of any other species. Extracts of human pituitary, like those from the pig, produced no luteinisation in the immature monkey.

From DE FREMERY'S results it seems that immature monkeys of the kind he used are almost wholly irresponsive to luteinising substances, since extracts which are purely luteinising had no effect at all, and extracts which on hypophysectomised rats produce a dual effect stimulated only the follicle of the monkey. The significance of these observations is not quite clear, but they apparently imply that the clinical use of luteinising preparations, in the hope of stimulating the development of luteal tissue, should be undertaken with reserve, while the maturation of the follicle by such preparations is improbable. On the other hand, if the monkey results are applicable to human beings, one would expect to find that stimulation of the follicle could be achieved fairly readily in women by the use of those gonadotrophic preparations that evoke (mainly or exclusively) this effect in test animals. Such preparations are now commonly available in the form of the gonadotrophic extracts from pregnant-mare serum, and it is encouraging to know that clinical tests of this comparatively new and potent material are now being actively pursued.

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THE EMERGENCY BLOOD-TRANSFUSION SCHEME TO DATE

THE first phase of an organised effort to provide a reserve of blood donors for London and the Home Counties in the event of a possible emergency came to an end on Saturday last. There is general agreement, strengthened by the lessons of the war in Spain, that blood-transfusion would play a major part in the treatment of air-raid casualties, hence the provision of an adequate supply of blood must be counted among the essential medical preparations for civil defence. The exigencies of casualty treatment during repeated air attacks might render blood matching, or even the determination of the recipient's blood-group, exceedingly difficult, there are obvious arguments for relying, in the main, on universal donors, and on a supply of stored blood. In this way it would be possible, given adequate supplies, to ensure that each casualty hospital would be able to perform a large number of transfusions with a minimum of delay. Here again valuable lessons have been learned from the war in Spain.

The inauguration of the sector scheme for emergency hospital services in London and the Home Counties provided an opportunity for planning a coördinated blood-transfusion service for this area, it was decided to establish four main depots—at Luton, Slough, Sutton and Maidstone—at which blood from universal donors could be collected, stored, and distributed to the London sectors. The Medical Research Council, acting on behalf of the Ministry of Health, undertook the organisation of these main depots. It was evident, however, that such depots could not be relied on to function during the first few days of an emergency, and that it would be unwise to leave the casualty hospitals without an alternative source of supply, even at later stages. It was therefore decided that, in addition to the donors required by the depots (most of whom would be drawn from the areas in which these are situated), a large number of volunteers should be enrolled and tested, who would be living, or working, in the more central areas of the London sectors. The organisation of this part of the scheme was deputed to a committee of sector-pathologists, working under the group hospital officers, the Medical Research Council acting only as a coördinating and advisory body.

The first essential was clearly the enrolment of an adequate number of universal donors, and this involved the grouping of a very large number of volunteers. Assuming the usual proportion of group IV blood (40 per cent., or a little over), and allowing for the migration that would probably occur in an emergency, the number of volunteers required in the London sectors alone has been estimated at about 100,000, and about an equal number would be required by the four depots. The depots, drawing volunteers from their immediate neighbourhood, were able to start the grouping earlier, and to envisage a long campaign of testing. They were aided by the British Red Cross, and by other voluntary organisations. The testing of volunteers in the London sectors was a more difficult undertaking. A wide appeal for donors meant the maintenance of many testing stations so that any volunteer could enrol at some station near his or her home or place of work. In the event it was found possible to maintain some eighty testing stations in the London sectors during the three weeks, July 3 to 22. Each station was open every week-day from 10–12 and from 5–8. The whole of this work fell, so far as the taking of blood samples was concerned, on the hospital pathologists, their technical staffs, and senior medical students from the teaching hospitals. The sacrifices demanded have been very great, since there could be no cessation of ordinary hospital activities, and the goodwill with which this added burden has been shouldered by all concerned is an example of what can be done by voluntary coöperation. It was necessary to provide an efficient clerical staff, in addition to the technical staff concerned in blood-testing, and here the Women's Voluntary Services have played a major part, supplying workers to assist at the testing stations and at certain central stations where much of the clerical work was done. On the appeal side, a group of publicity experts, the press, and the B B C all afforded help.

As the result of this coördinated effort some 50–60,000 volunteers have already been tested in the London sectors, apart from those tested at the depots. The campaign has made an excellent start, but it must clearly continue, though in London it must be at a less breakneck pace. Some thirty stations in the London sectors are remaining open, the hours of attendance being changed from 12 noon to 6 P.M., and the four main depots will continue to enrol and test volunteers until they have obtained the desired numbers. A list of these stations is available in every post office. In the provinces plans are not, in general, so far advanced. Here the service must clearly be developed on a local basis, in accord with local needs and opportunities, though it is expected that the enrolment forms and cards that have been used in London will be made available to local authorities through the Ministry of Health, and the apparatus devised for use in London and the Home Counties might with advantage be adopted elsewhere.

The appeals of the last few weeks have aroused the interest of the general public and have shown how readily people respond when told of an important service which any healthy person between 18 and 65 can perform.

The Privy Council have appointed Mr GERARD ROBERT HILL, C B, who recently retired from the Parliamentary Counsel's office, to be chairman of the Statutory Committee of the Pharmaceutical Society.

We regret to announce the death last Sunday of Mr ARCHIBALD YOUNG, regius professor of surgery since 1924 in the University of Glasgow. A week before, in view of his approaching retirement at the age limit of 65, he had been presented with his portrait by his colleagues and friends in Glasgow.

ANNOTATIONS

LONDON WATER

MEMBERS of the Paddington Medical Society who recently visited the Kempton Park works learned much about the London water undertaking Some 310 million gallons of water are consumed daily by a population of about 8 million The water is derived from the rivers Thames and Lee and from deep wells in the chalk or the greensand The well-water is of high organic purity and usually free from any evidence of pollution When however such evidence is present in the least degree the water is chlorinated before being passed into supply. The river water which provides four-fifths of the total is polluted before reaching the intakes, and to ensure that none of this pollution reaches the consumer this water passes through three stages of purification: storage, filtration and chlorination. The primary object of storage is the conservation of supply but its effect on the bacterial population of the water is profound *Bact coli*, which is the recognised index of sewage pollution, is usually present in 1 ml of raw river water, while after about thirty days' storage in a reservoir it may be absent in 10 ml or even in 100 ml The water reaching Kempton Park works comes from the Metropolitan Water Board's largest reservoir, the Queen Mary, which holds 6750 million gallons; water is pumped into this reservoir from the Thames at Laleham at the rate of about 100 million gallons a day. On reaching the works the water first passes through rapid mechanical filters designed to remove the grosser forms of suspended matter such as algæ and silt The visitors were shown these filters in operation and the method of washing them by air scour, followed by upward displacement of the accumulated deposit by water The secondary filters consist of 12 beds, each of about ¾ acre, composed of a layer of fine sand, 2 ft 6 in. thick, supported on shingle through which the water percolates downwards at the rate of 10–12 in an hour. When these beds become choked they are cleansed by hand, the top "skin" being skimmed off and passed through sand washers The effect of this filtration process is to reduce the *Bact coli* content to such a degree that two-thirds of the samples contain none in 100 ml In the final process of chlorination the water receives first a small dose of ammonia in the form of a solution of ammonium sulphate and then chlorine at the rate of 0·35 parts per million, the ratio of chlorine to ammonia being two to one The liquid chlorine is contained under pressure in large steel drums, the gas being passed through a measuring device and dissolved in water in a solution tower The solution of chlorine is then led to the general well through which all the water from the filters passes By means of chlorination a standard approaching 100 per cent of samples containing no *Bact coli* in 100 ml is maintained Finally the visitors inspected the engines which pump the purified water to service reservoirs from which it gravitates to the consumers.

STUDY OF EPILEPSY AT THE BURDEN INSTITUTE

THE study of epilepsy is entering on a new and hopeful stage. Striking evidence of this was the allocation of two days at the Brighton meeting of the Royal Medico-Psychological Association (reported on p 253) to the physiopathology of the disease and the directions in which the knowledge gained is leading therapeutic effort The great need is for prolonged and leisurely study and it is encouraging to learn that Mrs. R. G. Burden, who has already earned the gratitude of all engaged in neurological and psychiatric research by founding the Burden Institute, has now enhanced its value by endowing a hostel of 30 beds for patients undergoing investigation at the institute The hostel, which will be ready for use in a few months, is to accommodate patients in separate rooms with reasonable comfort At first it is proposed to reserve this hostel for cases of epilepsy and allied conditions The hostel will be under the control of a committee of the Burden Neurological Institute, the chairman of which is Sir Laurence Brock

NUTRITION IN THE COLONIES

IT has long been known that abundance and deficiency exist side by side in tropical climes—"malnutrition rife in a land of natural plenty," as a writer of Grains and Scruples [1] said of the West Indies—and this is borne out by articles published in these columns in the last two months on a deficiency of vitamin B_1 in East Africa,[2] a deficiency causing endemic glossitis in Palestine,[3] a deficiency of vitamin-B_2 complex in the Straits Settlements,[4] and a deficiency of vitamin A in Ceylon [5] In 1936 the then Secretary of State for the Colonies asked all colonial governors to report on standards of nutrition in their territories On receipt of their replies a Committee of the Economic Advisory Council was appointed to sift the evidence, make recommendations, and remain in being in an advisory capacity. The report of this committee has just been issued in two parts, part I consisting of general information about colonial dietaries, a statement of the principles of nutrition and practical suggestions for improvement, and part II being a summary of information regarding each territorial unit of the Colonial Empire.

From this report it appears that colonial dietaries are predominantly vegetarian, only very small quantities of animal products, especially milk, being consumed; and many of the peoples depend on a single crop There is consequently a deficiency of first-class proteins, calcium, and phosphorus The dietary is also usually low in fats, fruits, and green leafy vegetables Deficiencies of all vitamins except D are widely reported The difficulty of distinguishing between the effects of a deficient dietary and those of an infection is emphasised The committee consider that the two main causes of malnutrition in the Colonies are (apart from diseases) the low standard of living and ignorance, often combined with prejudice. The problem is one of improvements in agricultural production, on which the colonial population principally depends A "balanced agriculture" is the answer *to an unbalanced dietary.*

The low consumption of milk and its products is striking in colonial dietaries. Little or no milk is consumed after weaning There are, it is true, dangers associated with the use of fresh milk in tropical climes and in sometimes primitive conditions Dried skimmed milk can be imported and is said to give better value for money than any other form of manufactured milk. Suggestions are also made for the further development of fisheries and for

1 *Lancet*, July 15, p 156
2 Mackenzie, A., *Ibid* May 20, p 1143
3 Katzenellenbogen, I., *Ibid*, June 3, p 1260
4 Landor, J. V., *Ibid*, June 17, p 1368
5 Nicholls, L., and Nimalasuriya, A., *Ibid*, June 24, p 1432

the introduction of other crops, especially soya beans and ground nuts, and a valuable appendix, written by Dr B S Platt, shows how it is possible to live on well milled rice as the sole staple food without developing beriberi, if the following conditions are adhered to (1) the rice must be stored in such a way that it does not lose its vitamin B_1, (2) the rice must not be washed before being cooked, (3) there must be no superfluous water at the end of cooking, and (4) not less than 150 international units of vitamin B_1 must be supplied daily in the rest of the diet—e g, 6 oz of dried beans or 3 oz of ground nuts

DR WILLIAM BEAUMONT

THE main outlines of the extraordinary story of Alexis St Martin and of the energy and skill of William Beaumont in seizing on a unique opportunity are well known to every student of physiology, but probably very few appreciate the magnitude and importance of Beaumont's contribution to knowledge In fact there was but little detail of Beaumont's life or work available until the publication in 1912 of Dr Jesse Myer's "Life and Letters of Dr William Beaumont" The story is familiar An accidental gunshot wound received at close quarters left Alexis with a permanent gastric fistula beneath the remains of his rib So far was this injury from interfering with his general health or his digestive capacity that he lived to eighty three and was probably capable of much harder work than he was ever minded to undertake, for from many points of view Alexis was not an estimable character Beaumont had been called to the patient at the time of the injury and had confidently predicted a rapid death Contrary to his expectation Alexis survived, and Beaumont gave him the most devoted attention When the charity of the township was exhausted, he took him into his own household and continued his treatment for nearly two years after the accident By this time Alexis had regained his health and strength

Though Beaumont had been interested by the nature of the injury and by the opportunity which it had afforded him of seeing the actual processes of digestion, it was many months before he realised the unique chance for scientific experiment It is probable that at first he had carried out some investigations on the rate of digestion of various substances, but in a somewhat desultory fashion At all events, about two years after the accident Beaumont had begun a planned series of experiments, and he continued them for more than a year, when they were abruptly terminated by the disappearance of Alexis In spite of his best endeavours Beaumont failed to find any trace of Alexis for upwards of two years, and it was two more years before he was in a position to carry out further experiments, having taken Alexis into his household as a paid servant By this time Beaumont and Alexis had become famous, at any rate within a comparatively narrow circle, for it was not till the publication of Beaumont's book in 1833 that his researches became widely known Long before this, however, Surgeon General Lovell had realised Beaumont's value and, by generous furloughs and by making Alexis a sergeant in a detachment of orderlies, had rendered him most valuable assistance Indeed it is possible that without Lovell's aid Beaumont might have faltered in his purpose—but it is not probable, for the true scientific ardour which is obvious in all his work would not have recognised any barrier to be insurmountable Lovell's successor as Surgeon General was not equally in sympathy with Beaumont, and the clash between them ended in Beaumont's resignation of his commission From this time onwards till his death in 1853, twenty years after the publication of his book, he led the life of a busy and prosperous medical man in St Louis Throughout this period he made repeated attempts to get Alexis to return to him but without success

The work on which his fame rests was accomplished in the ten years between 1823 and 1833 What that work signified for the progress of the science of physiology is summed up in an appreciation by Professor Ivy, of Chicago, which is prefixed to a reprint of Myer's biography published this year[1] In spite of certain erroneous inferences, Beaumont's record of fact is so incontrovertible and stated in so scientific a method that Professor Ivy ranks him high in the field of original research and regards him not only as the first of American physiologists but also as the first American exponent of the true scientific method

EUTELEGENESIS

OUR U S A correspondent has already noted[2] the remarkable experiment in artificial insemination made by Dr Frances Seymour Mr and Mrs K had been married for eleven years and had been involuntarily childless The husband's semen contained 94 million highly motile spermatozoa per c cm and the motility index was within normal limits There were no discoverable defects in the wife's reproductive system and various therapeutic measures designed to promote fertility had proved ineffective Dr Seymour inseminated sixteen women, whose husbands were sterile, with Mr K's semen This step was taken with the consent and knowledge of the women concerned, though in several instances Mr K's religion and nationality differed from those of the sterile husbands It is further noteworthy that Mr K had the high intelligence quotient of 140 which, in Dr Seymour's words, "throws him in the genius group" No pregnancies ensued from these sixteen inseminations With the consent of the participants in the experiment, the same sixteen women were then inseminated with the semen of a man whose fertility had been proved by the fact that he was the father of two children This man's intelligence quotient of 120 again placed him above the average He was, moreover, an eminent figure in his profession and his wife, described as a highly intelligent college graduate gave full consent The sixteen volunteers and the wife of Mr K, who was also inseminated, all became pregnant

This novel experiment has several implications It proves, in the first place, that the presence of adequate numbers of motile and vital spermatozoa is not a necessary index of fertility, and it raises important legal questions which are the subject of a leading article in the issue[3] of the journal of the A M A which contained Dr Seymour's report The conclusion is reached that, in American law, children born of an artificial insemination by semen other than that of the woman's husband would be regarded as illegitimate The question of adoption proceedings therefore arises —

"The presumption of law that a child born during wedlock is legitimate is not absolute and conclusive under all circumstances Even at early common law the presumption was overcome by proof of the husband's sterility Today the presumption as to legitimacy is more easily controverted than it was in

1 London: Henry Kimpton 21s
2 *Lancet* 1939 1 1285
3 *J Amer med Ass* 1939, 112 183

earlier times. Now it is generally recognised by the courts that a child is illegitimate, though born or begotten during marriage, when it is impossible that its mother's husband could have been its father. Every species of legal evidence tending to this conclusion is admissible on the trial of the issue as to its legitimacy.

"In many instances of artificial insemination, perhaps in a great majority, the facts may never be known to any one other than husband and wife, and the physician involved. There is the possibility, however, that interested relatives may learn of the circumstances and may procure the evidence necessary to overcome the presumption of legitimacy and may thus deprive the child of a share of intestate property. It is the just due of the child that false pride or considerations of delicacy be put aside and that it be given, through adoption proceedings, the protection intended by the husband of the mother when he consents to the artificial insemination of his wife."

Dr. Seymour's experiment shows that artificial insemination can be used with a eugenic purpose and the word "eutelegenesis" has been suggested by Mr Herbert Brewer [4] to designate such an application of this measure. Its eugenic possibilities have further been discussed by Mr. H. J. Muller,[5] a pioneer in the field of experimental genetics. The possibilities of eutelegenesis are manifold and Dr. Seymour's experiment describes one of the simplest. It would clearly have been possible for Mrs K., and for the sixteen women collaborators in Dr Seymour's experiment, to have adopted children. But rather than adopt a child of alien and perhaps unknown parentage, they preferred to have a child of their own by a father of proved merit There are clearly grounds for regarding such a course as, in some respects at least, emotionally preferable to adoption. The mother has the experience of maternity and the father's attitude to the child might be regarded as comparable to that of a stepfather towards the children of his wife by a previous marriage. It would be interesting to know how far Dr Seymour's experiment would commend itself to couples in whom an undesired sterility is traceable to the husband.

DIPHTHERIA IMMUNISATION IN POLAND

In 1936 compulsory immunisation against diphtheria was adopted by Poland for children between the ages of one and ten years, an urgent incentive for this measure being the growing incidence of diphtheria in the country, for there were more than three times as many cases in 1937 as in 1926. In a communication to the French Academy of Medicine Hirszfeld,[6] of Warsaw, has traced the progress of this measure in terms of vital statistics It was necessary to pick out certain communities for his survey, because it has proved impracticable to apply the new law wholesale, without reference to social and geographical considerations The law seems to have been framed in an elastic spirit, for while allowing provisional exemptions under certain conditions it also permits of the extension of the age-limit above ten if necessary. In Lodz, where 80 per cent. of the child population has been immunised, the diphtheria morbidity was five times, and the diphtheria mortality fifteen times, greater among the non-immunised controls than among the immunised children of the same age in 1937. In Warsaw, on the other hand, only 60 per cent. of the child population has been artificially immunised, and here, to judge by the number of notifications, the diphtheria morbidity has apparently been uninfluenced by immunisation. Hirszfeld has alternative explanations for this fact The morbidity from diphtheria might have been even higher had immunisation not been partially effected, or immunisation may actually have enhanced the dangers for the non-immunised children by increasing the number of carriers of diphtheria—children who, had they not been immunised, would have contracted the disease and been isolated If his second suggestion is correct, half measures in diphtheria immunisation seem to be a doubtful blessing.

THE PERSONAL FACTOR

Scientists are human and being human tend to see their own work and that of others through the often distorting medium of their own personality, to be unfair to the unorthodox and original, and to put the claims of family or self-aggrandisement before the single-minded pursuit of truth The genius in consequence is often unrecognised or recognised too late In his "Scientists are Human" [1] Mr. D. L. Watson, Ph D, has assembled an impressive array of geniuses that never gained official or academic recognition, but being human himself he has rather over-weighted the instances in favour of his theory and under-weighted the others He allows that not every genius has died an embittered or thwarted man, but he does not seem to bring out that not all originality is genius, and that if the official scientist fails at times to appreciate the genius he also saves the world from much nonsense. Also, if the genius complains that one who came after him received the recognition denied to him, he must be sure that he gives due credit to those who preceded him. Dr. Watson has made some interesting contributions to a rather neglected aspect of scientific organisation. He finds a disproportionate emphasis placed on measurement, with a consequent neglect of the immeasurable Classification, abstraction and hypothesis are useful tools, but they must not be allowed to become ends in themselves The mental processes used in science have much in common with those used in the intuitive judgments of everyday life, and should be acknowledged as such. The student should be encouraged to respect his elasticity of mind rather than his infallibility, and for this purpose formal courses may prove a hindrance; their best value is for the student who is sufficiently mature to demand them. Dr Watson's central theme is then that scientists should appreciate the inevitable consequences of their humanity.

EUGEN BLEULER

Through the death of Professor Bleuler on July 15 Switzerland loses one of her most distinguished medical teachers and a psychiatrist whose name was familiar throughout the world Born in 1857 of yeoman stock at a village near Zürich, Bleuler found his natural affinity in mental medicine and after qualifying became psychiatric assistant in Zürich, Berne, Paris, London and Munich before his appointment, at the age of 29, to the headship of the Rheinau asylum near Schaffhausen. He brought new life into that ancient institution by introducing occupational therapy and putting the slighter cases under care at home He was one of the first asylum managers to recognise the value of Freud's teaching and he followed the developments of psycho analysis

4 *Eugen. Rev* 1935, 27, 121.
5 Muller, H J, Out of the Night, 1935, Vanguard Press, London
6 Hirszfeld, L, *Bull Acad Méd Paris*, May 23, 1939, p 712

1 London Watts and Co Pp 249 7s 6d

so far as his realistic view and his acute judgment permitted After the retirement of his teacher and friend, Auguste Forel, Bleuler succeeded him in the chair of psychiatry at Zurich and became director of the Burghölzli where he came in contact with C G Jung and published in 1911 "Dementia præcox or the group of schizophrenia" This book, based as it was on personal observation and on the Freudian conception of the unconscious, made him famous at once in the psychiatric world. He took the view that the schizophrenic psychoses present organic symptoms amenable only to somatic treatment and others which can be psychologically understood and dealt with by psychotherapy He thus became the chief exponent of the psychological school in psychiatry and an originator of psychotherapy Bleuler was an outstanding teacher and his pupils now occupy the chairs of psychiatry at Zürich, Basle and Berne His teaching was not confined to his staff, he followed Forel in his crusade against alcoholism and an attempt to educate a wider public Bleuler's own textbook of psychiatry, first published in 1916, went through several editions and was translated into many languages, but his scientific achievement did not prevent him giving personal care to every administrative detail in his institution Modest in his own life, and a democrat at heart, his patients will remember him for his fatherly advice, during visiting hours at Burgholzli he was often to be found at the gate ready to give a friendly word to the relatives of patients It was the combination of intelligence, character, self discipline, industry and unfailing search after truth that enabled Eugen Bleuler to achieve what he did even within the span of 82 years

PROPRIETARY MEDICINE LEGISLATION

WHEN the Chancellor of the Exchequer intimated his decision to maintain the medicine stamp duties for another year he gave a plain hint that the Government was prepared to examine proposals for controlling the sale of proprietary medicines by a method which would have regard to some other form of tax and, at the same time, to what he called "the aspect of public health" In more than one quarter this has been taken as an invitation for suggestions which might be examined with a view to embodying them in a measure of legislation, and in the circumstances it would not be surprising if the various interests vested in the proprietary medicine trade as well as those who regard the question from the public-health aspect were giving the matter careful consideration Professional and trading interests are in opposition and the interests of the several trade categories are also divergent On the other hand the public interest is closely bound up with "the aspect of public health" and that should be the line of approach to the goal which the Government would naturally desire to reach Thus the ideal method of solving the problem would be one prompted by public opinion which has no axe to grind, and it would seem that a possible measure of legislation has already been devised by parties who have no interest to serve other than the well being of the community It is understood that a bill has been drafted by a group of members of both houses of Parliament which seeks to control the traffic in proprietary medicines by requiring (1) the registration both of proprietors and the articles which they manufacture, and (2) the confidential disclosure of formulæ to the Ministry of Health This draft bill also provides for the refusal to register proprietary articles whose composition is such that the articles cannot possibly produce the results claimed for them on the labels The aim of the bill is not to interfere with legitimate trade but to put a check on heartless chicanery

LOCAL AUTHORITIES AND VOLUNTARY HOSPITALS

THE Ministry of Health's last annual report (for the year 1937–38) expressed the opinion that local authorities might make still fuller use of their statutory powers to give financial help to voluntary hospitals The report summarised those powers and the relevant passage is conveniently reprinted in Memorandum No 132 issued by the Central Bureau of Hospital Information The memorandum tabulates information, supplied in response to inquiry from the bureau, of 25 instances of financial arrangements of a capital nature between voluntary hospitals and local authorities The statutory powers are to be found in the Public Health Act of 1936 First in order of importance to the hospital, perhaps, though not in the order devised by the draftsmen, is the power under section 181 (3) for a local authority to give reasonable subscriptions or donations to voluntary hospitals without entering into any agreement for the reception of patients The only limitation here is the stipulation that the expense so incurred in any year is not to exceed the product of a 1½d rate or such higher sum as the minister may specially approve. The memorandum seems to give no typical instance of a contribution of this kind, because usually the local authority puts up its money for specific facilities for patients Secondly, there is section 271, which on the face of it is a mere supplementary clause for interpreting the meaning of the word "provide" in the act This section enacts that any power of a council to provide buildings or other premises includes a power to equip them with necessary apparatus and instruments, and any power of a council to provide buildings, premises, accommodation, equipment or vehicles includes a power to make agreements for the use of any suitable buildings, premises accommodation, equipment or vehicles The result is that a local authority can agree with a voluntary hospital for the use of a complete block or wing in the hospital or for the use of X ray apparatus or ambulances Moreover, for such a purpose, the local authority can make a capital contribution to provide the buildings, apparatus or ambulances and can, with the minister's consent, raise a loan in order to do so It is presumably under this section that the West Sussex county council has provided the Royal West Sussex Hospital at Chichester with £4000 and obtained in return the joint use of the deep X ray therapy department So also at Scarborough the borough council has provided £12,500 (secured on a mortgage of the whole of the hospital building) and obtains a maternity ward of 12 beds Thirdly there are subsections (1) and (2) of section 181 which give local authorities as part of their general power to provide hospital accommodation for the sick the right to make arrangements with voluntary hospitals for the reception of patients As the Ministry of Health report points out the hospital can build accommodation with the help of a capital contribution in respect of which the local authority can borrow money, the local authority can also pay for the maintenance of patients treated in accommodation provided by the voluntary hospitals The Ministry observes that local authorities have made most use of this third statutory power The Hertford

shire county council, for instance, pays £2600 a year for thirty years for the use of 50 beds in the Hertford County Hospital, maintenance being at the rate of £1 per patient per week with a minimum of £21 per week (subject to periodical review) The Kesteven county council pays the Grantham Hospital £4368 a year for twenty years for the use of 24 beds for medical, surgical and maternity cases; this sum is intended to represent the cost of maintenance, remuneration of the medical staff and repayment of the capital cost, and the scale can be adjusted every three years according to any rise or fall in the average cost of maintenance Naturally there is great diversity in this type of arrangement. This does not entirely exhaust the statutory powers. There is also section 67 of the Poor Law Act of 1930, enabling the councils of counties and county boroughs, subject to different limitations, to make annual contributions to the support and maintenance of a hospital. Finally the local authorities can arrange for accommodation in a voluntary hospital for the specialised health services, such as maternity and child welfare and the *treatment of tuberculosis, venereal disease, and now* perhaps cancer. There is evidence also of helpful local cooperation in such instances as the Bath Corporation Act of 1937, where the city makes a not ungenerous exchange of land and provides the Royal Mineral Water Hospital (now the Royal Hospital for Rheumatic Diseases) with foundations on a new site raised and levelled at the expense of the corporation.

TAVISTOCK CLINIC

PLANS are now ready for carrying on the Tavistock Clinic in war-time Should an emergency arise the clinic will move immediately from Malet Place to the Orchard Wing of Westfield College, Hampstead, and all patients will be notified of the change Private practice by members of the staff will also be carried on at Westfield Those who are called up for service will be able to have their private work referred to their colleagues, and can arrange for all professional messages to be put through to Westfield College The finance of the private side of the clinic will be centralised and all work done will be on a cash basis After paying administrative and other expenses the first claim on the pool of private fees will be to make up the weekly salaries of all the medical staff who are doing whole-time work to the level of pay of a captain R A M C—namely, 11 guineas a week. The remaining members of the staff will declare their weekly earnings at the clinic office so that they can be taken into account in levelling up incomes Any surplus in the pool will be held in the bank for distribution later.

CONFERENCE ON CRIPPLES

NEARLY 500 delegates attended the fourth world conference of workers for cripples held in London last week under the presidency of Lord Nuffield. This conference, the fourth of its kind in ten years, had as its object the interchange of views between all those concerned in the re-equipment of cripples for the work of life. Mr. Elliot, who was present as Minister of Health and reviewed the recent astonishing development of orthopædics, asked the conference to substitute the word "handicapped" for "crippled" to convey the hopefulness of the present outlook. Some well-known surgeons were present at the conference, but not so much as surgeons as in virtue of their interest in problems of organisation, educational training and rehabilitation.

A NATIONAL EMERGENCY MEDICAL SERVICE

A SCHEME has now been agreed between the Minister of Health, the Secretary of State for Scotland and the Central Emergency Committee of the British Medical Association providing for a national hospital medical service for the treatment of casualties in war-time Doctors joining the service will assume for a period of three years a definite liability to serve in an emergency. The service will be recruited from medical practitioners other than those holding whole-time posts under the Government or local authorities. Those wishing to join should apply to the B M A, either directly or through their local branch, and not to the Ministry or Department of Health. There will be two classes of service, A and B.

WHOLE-TIME SERVICE

Class A.—Practitioners in this class will be called up for whole-time hospital service in war-time and will be liable to be transferred temporarily to any part of the country. Those needed at the outset will be called up immediately; others will be called up as required and in the meantime may be employed as if they were in class B. They will be paid on the following scale:—

(*a*) Consultant adviser	£1400
(*b*) Group officer	1300
(*c*) Medical superintendent—	
Hospital of 1000 beds and over	1200
" 750 " "	1000
" 300 " " *	900
(*d*) Officer in charge of surgical or medical division (hospitals of 500 beds and over)	950
(*e*) Surgeon or physician specialists	800
Other specialists in charge of departments	800
(*f*) Medical officers	550
(*g*) House officers	350

These salaries are on a resident basis An allowance of £100 a year will be paid where board and lodging are not supplied

* Special consideration will be given in the case of hospitals with less than 300 beds

PART-TIME SERVICE

Class B—Practitioners in this class will be liable for hospital service on a sessional basis in their own hospital area according to the needs of the moment They will be paid on the following scale for work done in hospitals:—

(*a*) For consultant and specialist work	£2 12*s* 6*d* per session of two hours' duration up to 5 sessions in any week, with £2 2*s* for other sessions, subject to a maximum payment of 120 guineas a quarter
(*b*) For general-practitioner work	£1 11*s* 6*d* per session of two hours' duration up to 5 sessions in any week, with £1 5*s* for other sessions, subject to a maximum payment of 75 guineas a quarter

There will be no uniform for those employed under the scheme, but whole-time members will have a distinguishing badge or other emblem

Doctors recruited for the service will be allocated to their war-time positions now. Thus there will be created in peace-time a complete system of casualty hospital staffs which will come into action automatically immediately war is declared. The maintenance in every area of an adequate number of private practitioners who will continue their ordinary work in war-time will be secured, and arrangements have been made by which the practices of those who take up full-time work will be temporarily carried on by other doctors Any doctor who is still uncertain as to the way in which he can best serve the nation in war-time should seek the advice of the local emergency committee of the B.M A. in his area

SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION

MEETING IN ABERDEEN

THE proceedings of the representative body, which opened on July 21 with Dr H G DAIN in the chair, were at first concerned with international tension and its consequences

Contact with Doctors Abroad

The debates began briskly with an attack on the council's majority decision to withdraw from the Association Professionelle Internationale des Médecins (A P I M) Defending this decision Sir KAYE LE FLEMING (chairman of council) said he had always been very keen on international medical coöperation, but was not convinced that the A.P I M has served any useful purpose or is likely to do so The attendance at its meetings was very small, they were too widely spaced for any considered policy to develop, and delegates must speak French As a means of enabling representatives of voluntary bodies to discuss medical problems the A P I M was a failure It had never discussed the disasters that have overcome sections of the profession abroad Lately the election of a Czech as president, and the choice of Prague as meeting place, had had to be quashed because a member from a totalitarian state said that otherwise his government would not let him attend Mr R SCOTT STEVENSON, leading the opposition for Marylebone asked whether this country is going to abandon all international conferences because they are conducted in French The A P I M was not the only body that is sparsely attended or has abandoned Czechoslovakia Other representatives said that the B M A must not withdraw from an organisation which it helped to bring to birth, that it must not foster the narrow nationalism now triumphing, and that it should lead rather than run away—improve the A P I M and not desert it Dr PETER MACDONALD (deputy chairman of the representative body) thought this the worst possible time at which to extinguish one of the last flickering flames of coöperation with other countries, and Mr MCADAM ECCLES believed withdrawal from the A.P I M would be a blow to the international medical societies of specialists Mr V ZACHARY COPE said that anything that enables people of different nations to compare notes is good, that the B M A, with its expanding influence, should be in contact with Europe as well as the Empire, and that it would be disastrous to dissociate British doctors from colleagues on the Continent at this particular juncture "If there is ever a time when professional people all over the world should keep together and give a lead this is it," said Dr C F T SCOTT The practical merits of the A P I M as a bond were seriously questioned by one or two speakers, but the meeting accepted the Marylebone view that the B M A should remain a constituent member of it

Refugee Doctors

Dr ERNEST WARD, for Torquay, criticised the council because, without consulting the representative body, it told the Home Secretary that the association had no objection to the admission of a further 50 refugee practitioners This led Sir KAYE LE FLEMING to explain the steps taken Before the B M A was consulted some 200 doctors came into this country to practise The council then protested and the Home Office agreed to consult it about the numbers henceforth permitted entry and the persons to be chosen When accepted the foreign doctor must study medicine here for two years before registration, and for seven years afterwards he would remain under supervision by the Home Office, which could decide where he is to work On these terms the B M A consented to the admission of 50 Austrians The further decision to take 50 Czechs had to be made at short notice, even before the council assembled, "and I would be ashamed," said Sir Kaye, "to meet this body and say we were not prepared to do for Czechoslovakian doctors what we have done for Austrian doctors" On hearing which, Torquay withdrew its objection

Dr J MELVIN, for Wandsworth, proposed a counterblast to the Trades Union Congress's light hearted demand for the admission of more foreign practitioners let the association agree to take one medical refugee for every thousand absorbed by other trades and callings But Dr A A LEWIS, speaking for Kensington, thought the protest undignified, and it went no further

Asked to disclose how many refugees have been admitted to the Medical Register during the past twelve months Sir KAYE LE FLEMING said that in 1938 the number was 103, of whom 35 have joined the association It was impossible to dissect the total so as to show the various grounds on which they secured registration

Preparations for Emergency

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shire county council, for instance, pays £2600 a year for thirty years for the use of 50 beds in the Hertford County Hospital, maintenance being at the rate of £1 per patient per week with a minimum of £21 per week (subject to periodical review). The Kesteven county council pays the Grantham Hospital £4368 a year for twenty years for the use of 24 beds for medical, surgical and maternity cases; this sum is intended to represent the cost of maintenance, remuneration of the medical staff and repayment of the capital cost, and the scale can be adjusted every three years according to any rise or fall in the average cost of maintenance. Naturally there is great diversity in this type of arrangement This does not entirely exhaust the statutory powers. There is also section 67 of the Poor Law Act of 1930, enabling the councils of counties and county boroughs, subject to different limitations, to make annual contributions to the support and maintenance of a hospital. Finally the local authorities can arrange for accommodation in a voluntary hospital for the specialised health services, such as maternity and child welfare and the treatment of tuberculosis, venereal disease, and now perhaps cancer There is evidence also of helpful local cooperation in such instances as the Bath Corporation Act of 1937, where the city makes a not ungenerous exchange of land and provides the Royal Mineral Water Hospital (now the Royal Hospital for Rheumatic Diseases) with foundations on a new site raised and levelled at the expense of the corporation.

TAVISTOCK CLINIC

PLANS are now ready for carrying on the Tavistock Clinic in war-time Should an emergency arise the clinic will move immediately from Malet Place to the Orchard Wing of Westfield College, Hampstead, and all patients will be notified of the change Private practice by members of the staff will also be carried on at Westfield. Those who are called up for service will be able to have their private work referred to their colleagues, and can arrange for all professional messages to be put through to Westfield College. The finance of the private side of the clinic will be centralised and all work done will be on a cash basis After paying administrative and other expenses the first claim on the pool of private fees will be to make up the weekly salaries of all the medical staff who are doing whole-time work to the level of pay of a captain R A M.C —namely, 11 guineas a week The remaining members of the staff will declare their weekly earnings at the clinic office so that they can be taken into account in levelling up incomes Any surplus in the pool will be held in the bank for distribution later.

CONFERENCE ON CRIPPLES

NEARLY 500 delegates attended the fourth world conference of workers for cripples held in London last week under the presidency of Lord Nuffield. This conference, the fourth of its kind in ten years, had as its object the interchange of views between all those concerned in the re-equipment of cripples for the work of life. Mr. Elliot, who was present as Minister of Health and reviewed the recent astonishing development of orthopædics, asked the conference to substitute the word "handicapped" for "crippled" to convey the hopefulness of the present outlook. Some well-known surgeons were present at the conference, but not so much as surgeons as in virtue of their interest in problems of organisation, educational training and rehabilitation.

A NATIONAL EMERGENCY MEDICAL SERVICE

A SCHEME has now been agreed between the Minister of Health, the Secretary of State for Scotland and the Central Emergency Committee of the British Medical Association providing for a national hospital medical service for the treatment of casualties in war-time. Doctors joining the service will assume for a period of three years a definite liability to serve in an emergency. The service will be recruited from medical practitioners other than those holding whole-time posts under the Government or local authorities. Those wishing to join should apply to the B M A, either directly or through their local branch, and not to the Ministry or Department of Health. There will be two classes of service, A and B.

WHOLE-TIME SERVICE

Class A.—Practitioners in this class will be called up for whole-time hospital service in war-time and will be liable to be transferred temporarily to any part of the country. Those needed at the outset will be called up immediately; others will be called up as required and in the meantime may be employed as if they were in class B They will be paid on the following scale —

(*a*) Consultant adviser	£1400
(*b*) Group officer	1300
(*c*) Medical superintendent—	
Hospital of 1000 beds and over	1200
" 750 " "	1000
" 300 " " *	900
(*d*) Officer in charge of surgical or medical division (hospitals of 500 beds and over)	950
(*e*) Surgeon or physician specialists	800
Other specialists in charge of departments	800
(*f*) Medical officers	550
(*g*) House officers	350

These salaries are on a resident basis An allowance of £100 a year will be paid where board and lodging are not supplied

* Special consideration will be given in the case of hospitals with less than 300 beds

PART-TIME SERVICE

Class B—Practitioners in this class will be liable for hospital service on a sessional basis in their own hospital area according to the needs of the moment They will be paid on the following scale for work done in hospitals —

(*a*) For consultant and specialist work	£2 12*s* 6*d* per session of two hours' duration up to 5 sessions in any week, with £2 2*s* for other sessions, subject to a maximum payment of 120 guineas a quarter
(*b*) For general-practitioner work	£1 11*s* 6*d* per session of two hours' duration up to 5 sessions in any week, with £1 5*s* for other sessions, subject to a maximum payment of 75 guineas a quarter

There will be no uniform for those employed under the scheme, but whole-time members will have a distinguishing badge or other emblem

Doctors recruited for the service will be allocated to their war-time positions now. Thus there will be created in peace-time a complete system of casualty-hospital staffs which will come into action automatically immediately war is declared. The maintenance in every area of an adequate number of private practitioners who will continue their ordinary work in war-time will be secured, and arrangements have been made by which the practices of those who take up full-time work will be temporarily carried on by other doctors. Any doctor who is still uncertain as to the way in which he can best serve the nation in war-time should seek the advice of the local emergency committee of the B M A. in his area.

SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION

MEETING IN ABERDEEN

THE proceedings of the representative body, which opened on July 21 with Dr H G DAIN in the chair, were at first concerned with international tension and its consequences

Contact with Doctors Abroad

The debates began briskly with an attack on the council's majority decision to withdraw from the Association Professionelle Internationale des Médecins (A P I M) Defending this decision Sir KAYE LE FLEMING (chairman of council) said he had always been very keen on international medical coöperation, but was not convinced that the A P I M has served any useful purpose or is likely to do so The attendance at its meetings was very small, they were too widely spaced for any considered policy to develop, and delegates must speak French As a means of enabling representatives of voluntary bodies to discuss medical problems the A.P I M was a failure It had never discussed the disasters that have overcome sections of the profession abroad Lately the election of a Czech as president, and the choice of Prague as meeting place, had had to be quashed because a member from a totalitarian state said that otherwise his government would not let him attend Mr R SCOTT STEVENSON, leading the opposition for Marylebone, asked whether this country is going to abandon all international conferences because they are conducted in French The A P I M was not the only body that is sparsely attended or has abandoned Czechoslovakia Other representatives said that the B M A must not withdraw from an organisation which it helped to bring to birth, that it must not foster the narrow nationalism now trumpling, and that it should lead rather than run away—improve the A P I M and not desert it Dr PETER MACDONALD (deputy chairman of the representative body) thought this the worst possible time at which to extinguish one of the last flickering flames of coöperation with other countries, and Mr MCADAM ECCLES believed withdrawal from the A P I M would be a blow to the international medical societies of specialists Mr V ZACHARY COPE said that anything that enables people of different nations to compare notes is good, that the B M A, with its expanding influence, should be in contact with Europe as well as the Empire, and that it would be disastrous to dissociate British doctors from colleagues on the Continent at this particular juncture "If there is ever a time when professional people all over the world should keep together and give a lead this is it," said Dr C F T SCOTT The practical merits of the A P I M as a bond were seriously questioned by one or two speakers, but the meeting accepted the Marylebone view that the B M A should remain a constituent member of it

Refugee Doctors

Dr ERNEST WARD for Torquay, criticised the council because, *without consulting* the representative body, it told the Home Secretary that the association had no objection to the admission of a further 50 refugee practitioners This led Sir KAYE LE FLEMING to explain the steps taken Before the B M A was consulted some 200 doctors came into this country to practise The council then protested and the Home Office agreed to consult it about the numbers henceforth permitted entry and the persons to be chosen When accepted the foreign doctor must study medicine here for two years before registration, and for seven years afterwards he would remain under supervision by the Home Office, which could decide where he is to work On these terms the B M A consented to the admission of 50 Austrians The further decision to take 50 Czechs had to be made at short notice, even before the council assembled, "and I would be ashamed," said Sir Kaye, "to meet this body and say we were not prepared to do for Czechoslovakian doctors what we have done for Austrian doctors" On hearing which, Torquay withdrew its objection

Dr J MELVIN, for Wandsworth, proposed a counter-blast to the Trades Union Congress's light hearted demand for the admission of more foreign practitioners let the association agree to take one medical refugee for every thousand absorbed by other trades and callings But Dr A A LEWIS, speaking for Kensington, thought the protest undignified, and it went no further

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affairs in time of emergency. More help might be asked; but "let us keep the control of this machinery in our association, and be proud of it" Here Mr. H J McCURRICH pointed out that though aid is being given at the centre none is available at the periphery, and the local committees can ill bear the expense. Incidentally, said Brighton, the money is being spent partly for the benefit of doctors outside the association.

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Mr. McCURRICH asked how hospitals in reception areas are to be carried on if they are filled with refugees and the majority of the staff are removed. Nobody wished to penalise anyone joining the Territorials, but how was the work of hospitals to be done if men were appointed to them who would leave at the beginning of an emergency? Dr. LEWIS replied that posts should be filled according to the ability of the candidate and nothing else. Mr. McCurrich's hospital should not punish applicants because of a possible war; it should have a shadow scheme that would work without them. Dr. E. R. C WALKER thought it impossible to prevent prospective employers asking about the military obligations of employees; but it might be laid down that such obligations should not stand in the way of their appointment.—The suggestion was referred to council.

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The meeting unanimously approved a motion by Dr. GLADYS BOYD, for Edinburgh, that medical officers should be attached to the Women's Auxiliary Services, that these medical officers should be women, and that they should examine recruits.

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Schemes are being devised to ensure that practitioners undertaking service shall find their livelihood preserved on returning after a war. Dr. WARD said that in time of war all practice in London and some of the large towns might cease, whereas there would be an increase in reception areas. His division, Torquay, thought the proposed plans for filling in cards to be forwarded once a month to a classifying bureau would break down It might be preferable for the practitioner treating the case to give half the fee to the patient's own doctor. To this belated criticism Sir KAYE LE FLEMING wrathfully replied that the card system had been approved after consultation with areas where schemes were worked successfully during the late war, and was now ready for operation in four-fifths of the country.

The council has recommended that when a practitioner is called up in *peace-time* under the Auxiliary and Reserve Forces Act the names of his insured patients attended in his absence by another practitioner shall be restored automatically to his list "except in the case of those insured persons who express a wish to the contrary." Dr J. B. S GUY wanted this exception removed, since patients might get used to their temporary doctors and the absentee might suffer great loss of practice. Mr. A. HEDLEY WHYTE thought the words positively give a lead to patients to stay with their new doctor. Sir KAYE LE FLEMING, commenting on the plan that patients should be compelled to return to the absentee practitioner's list for a year, remarked that the B.M.A. holds by free choice of doctor. Under existing law the term of peace-time service was limited to three months.

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These limits, it is stated are applicable to London, elsewhere they would need to be lower, according to the local circumstances

East Yorkshire and Exeter proposed that each of these income limits should be reduced by £50—to £150, £200, and £250—with scope for periodical revision. The higher scale, said Mr RITCHIE RODGER, were a very bad bargaining instrument, they put the onus on the profession to prove that they are too high for a particular area, whereas the onus ought to be on the other side The income limits were personal limits, and four figure families could slip through the net moreover no account might be taken of subsidiary sources of income Everyone admitted that a man with £300 a year might find it hard to produce £40–£50 for an operation, but there were now provident schemes to aid him Dr F GRAY said that the contributory schemes were on trial, and it was always unwise to state maximum terms at the outset Dr H S HOWIE WOOD remarked that it is not until a contributory scheme has been in action for some time that one discovers the damage it does to private practice Dr A BEAUCHAMP, on the other hand, thought that if the level is reduced too low it would be very bad for the contributory associations which collected money for hospitals and did not all guarantee treatment Did the B M A want to put another nail in the coffin of the voluntary hospitals? Dr PETER MACDONALD (chairman of the hospitals committee) said that if the association put forward too low a figure it would antagonise the hospitals They were already conceding professional claims, for instance, the British Hospitals Contributory Schemes Association had agreed that services conveniently obtainable from private practitioners should not be given at hospital Mr RITCHIE RODGER, who sees the poor being squeezed out of hospitals by people with £300 a year, again urged the damaging effect of contributory schemes on general and consultant practice, but he failed to persuade the meeting to make his desired reduction of £50 in the scales submitted

The next part of the draft hospital policy to come under fire was the following paragraph —

"It is undesirable that private patients should be seen or treated at the outpatient department of a hospital unless such an arrangement is necessary in the interests of the patient It is recognised that certain forms of treatment involve the use of costly apparatus most readily available at hospitals, and that team work, so often essential, can be organised more easily at hospital Where the treatment of private patients is in fact arranged at out patient departments the following conditions should apply "

Dr S WAND saw in this an insidious approach to toleration for the practice of medicine in hospitals Exceptions were necessary, for example, deep X ray therapy must be given in a suitable department, and there are places where a visiting specialist has no facilities for working except at a hospital But the above paragraph left the door wide open to abuse What was meant by the "interests" of the patient, by "most readily available" or by "can be organised more easily" or "team work"? He saw a time coming when patients would be shepherded by contributory schemes to the outpatient departments, there to be seen by consultants whose fees would be assessed by the hospitals and contributory associations, he saw a time when consulting practice would be possible only under the control of hospitals, and only by those they see fit to appoint

Dr MACDONALD, in reply, accepted the words "in the *medical* interests of the patient", but opposed Dr Wand's proposed omission of the whole of the next sentence More and more private work, he said, is going to be done at hospitals, and the sooner we recognise this the better for the patient, the better for the hospitals, and in the long run the better for the consultants "Aha," replied Dr WAND, "Dr Macdonald has at last given himself away" There were two schools of thought about the desirability of private work being done at hospitals and the meeting must decide—It decided in his favour, omitting the words from "It is recognised" down to "more easily at hospitals" It also added, on his proposal, a statement that "at the earliest possible moment the results of the investigations and suggested treatment should be communicated to the practitioner, to whom the patient should be returned for treatment as soon as practicable"

Brighton then produced the case of the member of a contributory scheme whose income, though £300 a year or less, is derived partly or wholly from investments Money spent on the maintenance of health, said Dr A W GARDNER, should be treated as capital expenditure The small capitalist should be debarred from a contributory scheme, for an income of £250 at 3½ per cent represented £7100, and even if the patient had to sell £100 of shares to pay his fees he would still have £7000 and lose only 1*s* 2*d* a week of his income The non admission of such people had been dismissed last year as impracticable, but it was in operation at Plymouth Consultants said Mr MCCURRICH, will gladly give gratuitous service to the necessitous poor, but are people with £7000 necessitous poor? Dr S NOY SCOTT testified to the successful work of an "eligibility" committee at Plymouth since 1932 Dr MACDONALD maintained that the very few people affected could not be controlled, and that contributory schemes would refuse to make inquisitions into their members' source of income Dr LEWIS thought it inequitable to ask a man to give up 1*s* 2*d* a week for the rest of his life, since one would never ask a workman to surrender permanently part of his wages The meeting, however, agreed with Dr GARDNER that this would not be a terrific burden for the sake of health, and the Brighton resolution was carried

Monopoly of Pay-beds by Consultants

Dr R BOYD asked the representative body to view with concern the method by which auxiliary hospitals, and nursing homes connected with hospitals, are being monopolised by specialists and consultants on the staff of hospitals, to the exclusion of general practitioners The opening of homes attached to hospitals, he said, meant the closing of the private nursing homes to which practitioners have sent their patients and consultants were taking over practitioners' work The London provident scheme offered payment to patients for nursing home care—but only if they were under the care of a consultant

Mr ZACHARY COPE said it was only right that consultants giving two thirds or more of their time to gratuitous work at a hospital should have a prior claim to the use of pay beds attached to it But the

affairs in time of emergency. More help might be asked, but "let us keep the control of this machinery in our association, and be proud of it" Here Mr. H. J. McCURRICH pointed out that though aid is being given at the centre none is available at the periphery, and the local committees can ill bear the expense. Incidentally, said Brighton, the money is being spent partly for the benefit of doctors outside the association.

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3 Married couples with a child or children under 16, and persons with more than one dependant under 16 £300 a year, or £6 a week.

These limits, it is stated, are applicable to London, elsewhere they would need to be lower, according to the local circumstances

East Yorkshire and Exeter proposed that each of these income limits should be reduced by £50—i.e., to £150, £200, and £250—with scope for periodical revision The higher scales, said Mr RITCHIE RODGER, were a very bad bargaining instrument, they put the onus on the profession to prove that they are too high for a particular area, whereas the onus ought to be on the other side The income limits were personal limits, and four figure families could slip through the net, moreover no account might be taken of subsidiary sources of income Everyone admitted that a man with £300 a year might find it hard to produce £40–£50 for an operation, but there were now provident schemes to aid him Dr F GRAY said that the contributory schemes were on trial, and it was always unwise to state maximum terms at the outset Dr H S HOWIE WOOD remarked that it is not until a contributory scheme has been in action for some time that one discovers the damage it does to private practice Dr A BEAUCHAMP, on the other hand, thought that if the level is reduced too low it would be very bad for the contributory associations, which collected money for hospitals and did not all guarantee treatment Did the B.M.A. want to put another nail in the coffin of the voluntary hospitals? Dr PETER MACDONALD (chairman of the hospitals committee) said that if the association put forward too low a figure it would antagonise the hospitals They were already conceding professional claims, for instance, the British Hospitals Contributory Schemes Association had agreed that services conveniently obtainable from private practitioners should not be given at hospital Mr RITCHIE RODGER, who sees the poor being squeezed out of hospitals by people with £300 a year, again urged the damaging effect of contributory schemes on general and consultant practice, but he failed to persuade the meeting to make his desired reduction of £50 in the scales submitted

The next part of the draft hospital policy to come under fire was the following paragraph —

"It is undesirable that private patients should be seen or treated at the outpatient department of a hospital unless such an arrangement is necessary in the interests of the patient It is recognised that certain forms of treatment involve the use of costly apparatus most readily available at hospitals, and that team work, so often essential, can be organised more easily at hospital Where the treatment of private patients is in fact arranged at outpatient departments the *following conditions should* apply "

Dr S WAND saw in this an insidious approach to toleration for the practice of medicine in hospitals Exceptions were necessary, for example, deep X-ray therapy must be given in a suitable department, and there are places where a visiting specialist has no facilities for working except at a hospital But the above paragraph left the door wide open to abuse What was meant by the "interests" of the patient, by "most readily available" or by "can be organised more easily" or "team work"? He saw a time coming when patients would be shepherded by contributory schemes to the outpatient departments, there to be seen by consultants whose fees would be assessed by the hospitals and contributory associations, he saw a time when *consulting practice* would be possible only under the control of hospitals, and only by those they see fit to appoint

Dr MACDONALD, in reply, accepted the words "in the *medical* interests of the patient", but opposed Dr Wand's proposed omission of the whole of the next sentence More and more private work, he said, is going to be done at hospitals, and the sooner we recognise this the better for the patient, the better for the hospitals, and in the long run the better for the consultants "Aha," replied Dr WAND, "Dr Macdonald has at last given himself away" There were two schools of thought about the desirability of private work being done at hospitals and the meeting must decide—It decided in his favour, omitting the words from "It is recognised" down to "more easily at hospitals" It also added, on his proposal, a statement that "at the earliest possible moment the results of the investigations and suggested treatment should be communicated to the practitioner, to whom the patient should be returned for treatment as soon as practicable"

Brighton then produced the case of the member of a contributory scheme whose income, though £300 a year or less, is derived partly or wholly from investments Money spent on the maintenance of health, said Dr A W GARDNER, should be treated as capital expenditure The small capitalist should be debarred from a contributory scheme, for an income of £250 at 3½ per cent represented £7100, and even if the patient had to sell £100 of shares to pay his fees he would still have £7000 and lose only 1*s* 2*d* a week of his income The non-admission of such people had been dismissed last year as impracticable, but it was in operation at Plymouth Consultants, said Mr MCCURRICH, will gladly give gratuitous service to the necessitous poor, but are people with £7000 necessitous poor? Dr S. NOY SCOTT testified to the successful work of an "eligibility" committee at Plymouth since 1932 Dr MACDONALD maintained that the very few people affected could not be controlled, and that contributory schemes would refuse to make inquisitions into their members' source of income Dr LEWIS thought it inequitable to ask a man to give up 1*s* 2*d* a week for the rest of his life, since one would never ask a workman to surrender permanently part of his wages The meeting, however, agreed with Dr GARDNER that this would not be a terrific burden for the sake of health, and the Brighton resolution was carried.

Monopoly of Pay-beds by Consultants

Dr R BOYD asked the representative body to view with concern the method by which auxiliary hospitals, and nursing homes connected with hospitals, are being monopolised by specialists and consultants on the staff of hospitals, to the exclusion of general practitioners. The opening of homes attached to hospitals, he said, meant the closing of the private nursing homes to which practitioners have sent their patients, and consultants were taking over practitioners' work The London provident scheme offered payment to patients for nursing home care—but only if they were under the care of a consultant

Mr ZACHARY COPE said it was only right that consultants giving two thirds or more of their time to gratuitous work at a hospital should have a prior claim to the use of pay beds attached to it But the

general practitioner should be able to look after his patient after operation (Dr. H C. PURCER SMITH was surprised to hear that the surgeon's task ended when the operation was over.)

Dr. MACDONALD believed that the basic difficulty is that there are not enough hospital beds in the country to allow practitioners to have them. They must be kept for urgent cases or those requiring specialist attention But he reminded Dr Boyd that the B M A policy already urges the advantages of the "open door" and speaks of provision for patients and doctors who have formerly used nursing-homes.

The Midwife as Anæsthetist

Hitherto the B M A. has maintained that only doctors and dentists should administer anæsthetics The council now recommends that the midwife's right to give nitrous oxide and air during labour should be recognised, under certain conditions, one of which is "that the patient has within one month before her confinement been examined by a registered medical practitioner who has handed to the midwife a certificate in writing that the patient is in a fit condition for gas-and-air administration." A lively but complex discussion arose on this proposal, put forward by Dr J. W. BONE as chairman of the general practice committee.

Dr A. S. WIGFIELD, for East Herts, asked how a practitioner was to say that in a month's time a woman would be fit to have an anæsthetic from a midwife. If midwives could decide whether a woman needed medical aid during labour they could decide whether she could stand gas and oxygen.

Dame LOUISE MCILROY begged the meeting not to reject this one and only medical safeguard on a quibble about a day or a month The profession was allowing midwifery to slip from its hands, and not making an effort, as it should, to keep control of antenatal care Sir EWEN MACLEAN likewise advised that the doctor should keep in touch with the midwife's work; and so did Sir BECKWITH WHITEHOUSE, who did not much mind whether the examination is made one month, two months, or three months before labour, so long as it is made

Two Scottish representatives, Dr. J B. MILLER and Dr E. K MACKENZIE, explained that in the enlightened north anæsthetics for midwifery can be given only by registered practitioners They were horrified by the discussion. "Good gracious me," said Dr. Mackenzie; "you English people, come to your senses!" But Sir EWEN MACLEAN was unmoved. In many areas south of the Border, he said, more than 70 per cent. of confinements were attended by midwives, and to discourage the use of anæsthesia by them would be a disservice to the public

On the question whether midwives could safely use gas and air, Dr. J C A. NORMAN declared that true anæsthesia could be induced with a Minnitt apparatus, that anæsthetics (an art) could not be taught quickly, and that the presence of another midwife or student as laid down in the regulations made it all the more dangerous, because more gas could be given Another speaker described gas as one of the most dangerous anæsthetics Mr A. M. A MOORE, by contrast, considered the gas-and-air machine absolutely safe and simple; and Dame LOUISE MCILROY described it as safe as far as safety can go.

The more important argument, however, centred round the effect of the regulation and the effect of approving it. Dr. J. E STACEY and many others wanted to stop midwives controlling the midwifery of the country. He thought that few medical men would certify that a woman would a month later be fit for an anæsthetic, and so in fact the anæsthetics would not be given unless (as was proper) a practitioner had charge of the case. Other speakers urged that if the B.M A held that every woman in childbirth should be under the care of a doctor—who was able to meet emergencies, anæsthetic and otherwise—it should say so. "Our job," said Dr FORBES, "is to say what's ideal"; the B M A. decision would not stop midwives giving gas, but there was no reason why the B M A. should go out of its way to authorise it.

Dr P. PHILLIPS almost won the meeting's approval for an amendment allowing midwives to administer analgesia rather than anæsthesia; but Dr. FORBES and Dr O C CARTER successfully claimed that these cannot be differentiated. The meeting then declared itself opposed to the council's decision; and the B M A. policy will therefore make no mention at present of the giving of anæsthetics by midwives.

Information to Insurance Companies

Dr. A. M. JOHNSON, for Bury, questioned the propriety of supplying insurance companies with a "duration of illness" certificate after the death of a patient. The insurance company wanted to discover whether the person insured was healthy when he took out the policy; if not, it would dispute the relatives' claim. But if insurance companies took the risk of issuing policies without medical examination why should they be covered retrospectively if they backed a loser? Often patients in poor health were bullied into insurance If certificates of this kind were refused the companies would see that there was a medical examination before policies were issued. This last argument was not accepted by all speakers and Dr W. J. O'DONOVAN objected that it would be a professional impertinence to say that people shall be insured only "if we have a rake-off first"

Dr. FORBES said it was already possible to refuse a certificate, or to give information only with the relatives' consent. Sometimes the certificate was useful, since it enabled a claim to be settled favourably at once On the other hand if a doctor refused to issue one the company might sub pœna him before an industrial-insurance court. Dr. JOHNSON believed that the companies would never dare to bring these cases into the light of day. Dr. J CLAYRE thought that companies would find the expense of medical examinations offset by a gain in reputation, since great harm was done in the minds of lately bereaved families by contesting their confident claims Dr. G LAURENCE maintained that companies asked for certificates only to evade responsibilities undertaken with their eyes well open: Dr. N E WATERFIELD said that where that seemed to be so he always refused to certify and advised the relatives to stand on their rights But often it saved much bother to give the certificate asked for. Dr. A A LEWIS refused to consider the bother, if the principle was wrong

Dr. BONE incautiously said that this was an old story; it had often been argued before Dr. JOHNSON replied that if it had been discussed for twenty years, there was all the more reason for getting something done The meeting agreed, and said that "the action of medical practitioners in giving 'duration' certificates to insurance companies (or to the relatives of the deceased at the request of insurance companies) relating to the health of their patients before death should be discontinued."

N.O.T.B.

The council has approved a proposal to convert the National Ophthalmic Treatment Board into a private company limited by guarantee. But the steps proposed "to regularise the position of practitioners associated with the work of the board" have been criticised (see *Lancet*, July 22, 1939, p. 227).

Dr. A. ESTCOURT OSWALD said that ophthalmic surgeons, who would have to accept the terms or lose their work under the National Ophthalmic Treatment Board, had not had time enough to consider the scheme finally announced on July 14. Dr. R. H. BALFOUR BARROW complained that they had to agree to rules that might be varied from time to time by the B.M.A. and to penalties not yet stated. Dr. STEVENSON explained that disciplinary control would rest with the association's ophthalmic group committee—a purely professional body whose proceedings had in turn to be reviewed by the council, and Dr. H. CAIGER condemned the objectors as "again the government." Dr. WAND, however, supported the plea for delay, and though Dr. MACDONALD said it was urgently necessary to complete the arrangements in order to secure legal protection for the letters N.O.T.B., the representative body sympathised with Dr. Estcourt Oswald's objection to signing a document she does not find explicit. The council was asked to reconsider it.

First-aid in Industry

Dr. WAND spoke of the loss to industry from injuries—estimated at £50,000,000 a year. Those giving first aid were insufficiently trained, and too much treatment was done by them and expected of them by employers. Industry had never had a lead from the profession. He presented an appendix to the council's report—since reprinted as a booklet "First aid in Industry"—which, he said, gave such a lead. Subsequently a book of training was to be issued, and leaflets on poisoning, applicable to particular trades. He hoped that the association's message to industry might save both money and misery.

Pasteurisation

Dr. WARD, for Torquay, urged the council to persuade members to do their best to convince the public of the value of effective pasteurisation, "which, while preserving the nutritive qualities of the milk, affords a guarantee against the risk of tuberculosis and other milk-borne infections." On a suggestion being made that it affords only a "reasonable degree" of safety Sir KAYE LE FLEMING said there was now no shadow of doubt that it gives complete protection and in no way diminishes the value or (necessarily) the palatability of milk. "We have with us," he said, "the Ministry of Health and the Board of Agriculture, we have against us an ill-informed public opinion, an *ill informed* House of Commons, and an ill *informed* agricultural industry." The ministries said that they could not legislate in advance of public opinion.

Dr. R. MAULE HORNE declared that the new Milk Bill, without mention of pasteurisation, meant that more mothers and more babies will drink more unsafe milk. The cause of safe milk had had a set-back, and effort must be redoubled. Dr. W. S. MACDONALD said that the B.M.A.'s advocacy of pasteurisation had aroused enmity among farmers and small distributors, some of whom were trying hard to clean up their milk, and to produce clean milk was better than to heat dirty milk. Dr. A. W. GARDINER also preferred raw milk and said that it does not cause pulmonary tuberculosis. Dr. P. W. EDWARDS regretted that many pasteurising firms, caring more for money than milk, do their work badly and lead their customers into a fool's paradise. In Scotland, he added, 4 per cent. of pulmonary tuberculosis is due to bovine infections and in his own district 2·2 per cent. These percentages represented very large totals. Dr. C. O. STALLYBRASS also pleaded for pasteurisation and Dr. A. A. EAGGER related how a diet of milk from tuberculin-tested cows had given him undulant fever.

Torquay's motion was passed with only 5 dissentients.

Diphtheria Immunisation

The City of London moved that in view of the small proportion of children immunised against diphtheria and the danger of the disease spreading among those evacuated in war time, steps should be taken to press the public to accept inoculation. Dr. J. FETTES, proposing, said that only 5·6 per cent. of London children had been immunised, and assuming that 20 per cent. are naturally immune, this meant that three-quarters of the child population is susceptible. In Aberdeen county, he was informed, 75 per cent. of parents consented to immunisation and in Aberdeen city over 50 per cent. But in an emergency Aberdeen would have to receive 32,000 child evacuees, and before inoculating any of them written consent from the parents or guardians would have to be obtained. He deplored the apathy of practitioners towards this wholly preventable disease, they often did not care to give two injections at 2s. 6d. each. Dr. C. O. S. BROOKS said this apathy was harder to overcome than opposition, but the B.M.A. could overcome it if its members showed they are convinced of the necessity and safety of prophylaxis. Dr. A. MCCARTHY pointed out that the best publicity is that given by the individual doctor attending his patients. Practitioners should offer their services for this purpose to the medical officers of health. Dr. R. A. WILSON described the measures now adopted by Guernsey, where next week every child between two and ten years old will have been immunised. Dr. MELVIN said that the number of deaths from diphtheria in England and Wales is equal to the number of deaths of women in child-birth. All the deaths from diphtheria could be prevented for a fraction of the money spent on reducing maternal mortality.

After Professor PICKEN, as chairman of the public-health committee, had expressed his pleasure that such an initiative, on a purely preventive issue, should come from general practitioners, the City's motion was carried without dissent. A further motion, suggesting that compulsory immunisation of children should be recommended to the Government, was withdrawn.

A Woman for the G.M.C.?

Two direct representatives are to be elected this autumn to the General Medical Council, and Dr. WARD, for Torquay, besought the meeting to say that one of the nominees of the association should be a woman. Dr. STEVENSON pointed out that no woman is likely to be appointed from any other source, and Dr. T. CRAIG believed that it would be an asset to the G.M.C. to have one. But every other speaker except Dr. A. A. LEWIS, was against the proposal.

Dr. F. A. ROLPH said that there was at present no bar, any electing body could choose a woman. Indeed the late Dr. Christine Murrell had been an outstanding member of the council, though she had

not lived to take her seat. If a woman were elected as B.M.A. nominee for England and Wales the women doctors of Scotland and Ireland might have a grievance. No minority should be given exclusive representation; it would be as reasonable to ask it for doctors with red hair. Dr. WATERFIELD held that women want equality, not privileges, and the only woman speaker, Miss BEATRICE TURNER, agreed with him, saying that women should be appointed on their merits, not as weaker vessels. If a woman was wanted, said Dr. S. A. FORBES, the machinery for her election was fully available.

So far as the association is concerned this machinery will continue to work as hitherto; for the motion was rejected

Officers of the Association

Sir BECKWITH WHITEHOUSE, F.R.C.O.G., was elected president for 1940–41, to take office when the association visits Birmingham next year. Sir KAYE LE FLEMING, chairman of council, was elected a vice-president, and on the retirement of Mr. N. Bishop Harman from the office of treasurer, after fifteen years' service, Dr. J. W. BONE was elected treasurer in his stead. Dr. H. G. DAIN and Dr. PETER MACDONALD remain chairman and vice-chairman of the representative body.

Dr. Dain's most sensational action at last week-end's meeting was to take a roll-call of representatives. About the middle of Saturday morning, the number present had fallen well below the quorum of 50 per cent; and, *horribile dictu*, not every absentee had asked personal leave of absence as standing orders require

(To be continued)

MENTAL HEALTH

SUGGESTED MERGER OF VOLUNTARY AGENCIES

THE formation of the Feversham committee, whose report * has just been issued, was the outcome of a widespread movement towards the coördination of the voluntary mental-health services. The Board of Control, as the central statutory authority for mental health, have taken an important part in coordinating the various branches of the official mental-health services and in bringing together the voluntary organisations associated with these services. The report of the Feversham committee quotes an extract from the annual report of the Board of Control (1935) which states their attitude in clear and forceful terms:—

"The Board have noted with pleasure the growing movement in favour of combining, whether by complete amalgamation or by federation with a central body, all the various voluntary agencies interested in different aspects of mental health. The want of unified direction and a comprehensive central body able to view the problem as a whole has made the mental hygiene movement relatively ineffective in this country. Without some measure of union, or at least of coördination, no effective appeal can be made to the public for financial support and, an even graver source of weakness, no real advance can be made in educating public opinion so that the needs and possibilities of the work may be more fully realised. The development of any health service depends upon close cooperation between voluntary effort and governmental or municipal activities. Legislation in advance of public opinion is almost always inoperative, nor can local authorities be criticised for failing to do more than their constituents want them to do. There are limits to the extent to which central departments can influence or, indeed, ought to attempt to influence public opinion. It is therefore all the more important that the present multiplicity of voluntary organisations should be coordinated if the importance of mental hygiene is to be adequately realised."

This statement of the Board of Control is at once a challenge and an encouragement to the voluntary mental-health services. The Feversham committee have taken up the challenge and produced a comprehensive report showing both the defects of the existing voluntary services—lack of coördination on the one hand, and overlapping and waste of effort on the other—and the methods by which these defects should be remedied. In the preparation of the report the committee have taken evidence from practically every source which might be expected to afford relevant information. Questionnaires were sent to all government departments dealing with mental health from any angle, to the councils of all administrative counties and county boroughs, and to all voluntary mental-health societies and clinics. Besides, special information was sought from individuals selected either because of their specific knowledge of mental-health work or for their general experience of public and social affairs. The replies to these questionnaires were carefully classified by the committee, and the report is the final outcome of the evidence which was studied and sifted.

PRESENT STATE OF MENTAL-HEALTH SERVICES

The Feversham report falls naturally into three main sections. The first deals with the mental-health services, both statutory and voluntary, as they are today. It shows how these services grew up, each in response to a particular need, and how lack of coordination was inherent in this haphazard form of development. The statutory position of mental disorder, mental defect, and delinquency is fully discussed, and special reference is made to defects in the law which have had an adverse effect on the growth of the voluntary services. In the realm of mental deficiency, for example, the stigma of certification before appropriate education can be provided for a child is once more condemned, and the anomalies of notification of defective children to the statutory authority are clearly brought out:—

"There can be no doubt that the object of notification is to secure proper supervision for a child who is socially defective. Yet the law is so framed that (with minor exceptions) . . . only those children who have been in attendance at special schools or classes can be notified to the mental deficiency authority. This restriction is in our opinion indefensible. It is the greatest single obstacle to successful community care of defectives. The replies which this committee have received show that the overwhelming majority of mental welfare associations lament the fact that the very children who are in greatest need of supervision after they leave school are denied this benefit *because they have also been denied the opportunity of receiving instruction in special schools or classes.*"

The report also shows that the statutory powers under the Education Acts are too limited to encourage the development of modern services for the child. The committee feel that the time has come for granting frank specific powers of contribution by local-education authorities to voluntary services such as child guidance and the institutional care of difficult children.

* The Feversham Committee (47, Whitehall, London, S.W.1). The Voluntary Mental Health Services, 2s. 6d.

MENTAL HEALTH CLINICS

In the second main section of their report the committee deal critically with the evidence which they have received A considerable mass of information has been accumulated to show that the establishment of mental health clinics throughout the country is a great and urgent need It is clear, however, that the present position is far from satisfactory Some authorities are paying only lip service to the provisions of the Mental Treatment Act, 1930 Some of the clinics which have been organised meet only once a month and do not provide even the rudiments of an efficient service, some are so overcrowded that individual attention is impossible, and others are either understaffed or attended by inadequately trained personnel The committee take the view that the normal situation for a diagnostic outpatient clinic is the general hospital, except in the great cities where a clinic established for mental health purposes, can within its own bounds provide all facilities for physical as well as mental investigation The minimal requirements of an efficient clinic are discussed, and great emphasis is laid upon the value of fully trained psychiatric social workers Although it is agreed that, in general the most suitable location of an outpatient clinic is in association with a general hospital, it is admitted that few such clinics in fact provide a sufficient number of separate rooms for effective work, and that the accommodation is often otherwise unsuitable— dismal ill decorated rooms, uncomfortable furnishing, and a general lack of attention to those little, delicate homely features of decoration which make all the difference between the cold atmosphere of an institution and the warm, attractive surroundings of a room which inspires confidence and a sense of peace "

The scope and limitations of the mental health clinic are examined, and the view is expressed that the mental health service in the average area should be a single organisation. The clinic should therefore deal with patients of all ages who are likely to benefit by psychiatric treatment Mental defectives as such would be excluded, except in so far as they presented psychoneurotic conditions or problems of conduct and social adjustment susceptible of treatment

INSTITUTIONAL TREATMENT

In the chapter relating to mental-hospital treatment the committee point out that in many areas the provision for early cases is scanty, especially for patients suffering from recoverable forms of mental disorder who are not willing to go as voluntary patients to mental hospitals and yet would be willing to undergo treatment if it were available elsewhere The evidence of existing conditions is summed up as follows —

(1) A steadily increasing use should be made of the facilities for voluntary treatment provided at the more progressive mental hospitals

(2) Very many local authorities have not yet made full use of their powers to admit voluntary patients

(3) There is lack of cooperation between the various agencies providing inpatient accommodation for mental cases—mental-hospital authorities, public-assistance authorities, and voluntary bodies

(4) The need for special accommodation for early and transient non certifiable cases is not fully appreciated

The committee urge that voluntary effort could do much to meet this need if coöperation could be secured The remedy which the committee suggest is resolved into two propositions (*a*) where one of the great medical teaching centres is within reach, a special hospital for early mental and functional nervous disorders should be established in close association with the teaching school, and (*b*) where no teaching centre is available, a special block for early cases should be established in close connexion with or at the general hospital serving the area

MENTAL DEFICIENCY

In the chapter dealing with mental deficiency the most urgent problem in mental health arises from lack of coöperation within the statutory area itself At least four committees of a local authority may have mental health functions, and in many areas little progress has been made towards coöperation The committee feel that one of the most important contributions which voluntary associations can make to the community care of defectives is to link together all the agencies, both statutory and voluntary, in a single enterprise so that no part of the field is left uncovered

MENTAL HEALTH OF CHILDREN

In an interesting chapter devoted to the mental health of children it is suggested that prevention, in the sense of promoting positive health, is the most important aspect of child guidance Child guidance should not stand alone, it operates most effectively through the existing agencies for child welfare and education The great majority of the difficulties and maladjustments of childhood can and should be dealt with inside the ordinary educational system especially through coöperation between home and school Voluntary effort has two functions in relation to the mental health of children preliminary organisation to demonstrate throughout the country the need for a child guidance service, and assistance even in the fully established clinic to the trained personnel to provide the right atmosphere of friendly informality

EDUCATION OF THE PUBLIC

Publicity has come to stay, as a feature of modern life, and propaganda has great powers for good as well as for evil The report of the Feversham committee lays a just emphasis on the importance of public education in mental health and offers constructive suggestions on the best means of making it effective At the same time a salutary warning is given against the risks of unskilled presentation of mental health problems, especially that which lays emphasis on the pathological rather than the normal The aims of public education are summarised thus —

(1) To foster a healthy attitude towards mental illness, regarding it as similar in all essentials to physical disease, with a definite pathology and with genuine possibilities of prevention, alleviation, or cure

(2) To educate the public in the principles of normal psychology and mental hygiene especially with regard to the child

(3) To explain and to spread knowledge of the functions of the mental health services, including mental hospitals clinics for early disorders, and facilities for the promotion of mental health in children

ORGANISATION OF MENTAL HEALTH SERVICES

After setting out in summary form their principal recommendations, the committee proceed to discuss, in the third section of the report, what is in a sense the most immediate problem—the internal organisation of the voluntary mental health services In their view, lack of coördination exists to such an extent that the services do not give full value in return for

the time, money, and effort spent upon them The evidence proves the committee's case beyond doubt and shows that the earlier methods adopted to secure cooperation between the various voluntary agencies have all failed in their object, because they have not achieved unity of effort. The only policy which has a claim to far-sighted statesmanship is complete amalgamation, and the committee's scheme not only promotes amalgamation but also shows in a thorough practical way how it can be carried out. It is recommended that a new central voluntary body be set up for England and Wales to be called the National Council for Mental Health This body is to be the product of fusion between the existing central voluntary associations directly concerned with the promotion of mental health the Central Association for Mental Welfare, the Child Guidance Council, the Mental After-Care Association, and the National Council for Mental Hygiene Agreement has already been reached in principle between three of the associations; it appears that the Mental After-Care Association has not yet seen its way to cooperate.

The aims of the new council are comprehensive; their chief object is to create in the public mind a new outlook on mental health and a new understanding of its meaning. The creation of a single central voluntary association should go far to stimulate the interest of local authorities by organising training and establishing recognised standards of competence. Coördinated voluntary effort is also greatly needed for the promotion of research and the collection of authoritative records It is to be hoped that the new council will be successful in awakening greater public interest and active support in the much neglected field of mental health in this country

BEIT MEMORIAL FELLOWSHIPS FOR MEDICAL RESEARCH

A MEETING of the trustees of the Beit Memorial Fellowships for Medical Research was held on July 19 They received with regret the resignation from the advisory board of Sir Gowland Hopkins, O M, who throughout the long period of 25 years had given wise counsel at the meetings of the board and in his biochemical department at Cambridge had directed the research studies of perhaps a greater proportion of those elected to Beit fellowships than any other head of a department has done They also regretted the resignation of Sir Patrick Laidlaw, F R S, after eight years of keenly attentive work These vacancies were filled by the appointment to the board of Dr. R. A Peters, F.R S, Whitley professor of biochemistry in the University of Oxford, and of Dr Paul Fildes. F R.S, bacteriologist on the scientific staff of the Medical Research Council It was reported that C H O'Donoghue (fellow 1912–13) had been appointed to the professorship of zoology in the University of Reading; J T. Irving (1926–28) to the professorship of physiology in the University of Cape Town, G F Marrian (1927–30) to the professorship of chemistry in relation to medicine in the University of Edinburgh; F H Smurk (1930–34) to the professorship of medicine in the University of Otago; and H P Himsworth (1932–35) to the professorship of medicine in the University of London at University College Hospital

It was in 1910 that the first Beit fellow, now Sir Thomas Lewis, F R S, was elected, and last year's election in 1938 brought the total of all fellows elected to exactly 200 Women are eligible and have been elected from 1910 onwards, their total being 30 out of the 200 Of the 170 men, 6 have been elected to the fellowship of the Royal Society, and no less than 34 have already been appointed to university professorships, of which 5 were in physiology, 5 in pharmacology, 5 in medicine and 9 in chemistry or biochemistry. The Dominions overseas hold 8 of these past Beit fellows as present professors None of the women have yet been promoted to university professorships, though at least 6 of them are doing work of much distinction and one has for some years been director of an important research laboratory. The opportunities for a woman to obtain a university chair in scientific subjects are still restricted Though the fellows have come from all parts of the British Empire and have subsequently gone to laboratory posts all over the world, in their choice of a place of research during their fellowships they have tended to group themselves at three main centres. Out of the total 200 the laboratories of the University of Cambridge have held 55 fellows, and 29 of these were personally directed by Sir Gowland Hopkins in the great biochemical school that he developed in the Dunn Laboratories immediately after their opening in 1925 University College and University College Hospital in London together have provided opportunities for the work of 39 fellows. The Lister Institute of Preventive Medicine has accepted 35 A total of nearly £190,000 has been disbursed to fellows since 1910.

The following elections to fellowships were made:—

FOURTH-YEAR FELLOWSHIPS

ISAAC BERENBLUM, M D, M Sc Lond To continue his work on the production of cancer by skin irritants, and to study the metabolism of living cells in tissue culture. At the school of pathology, University of Oxford

THOMAS ARTHUR HOWARD MUNRO, M B Edin, F R C P E To continue his studies of the rôle of inheritance in mental disorders At the Royal Eastern Counties Institution, Colchester

ALBERT NEUBERGER, M D Wurzburg, Ph D Lond To extend his work on the chemistry of amino sugars in elucidation of the structure of natural compounds At the department of pathological chemistry, University College Hospital medical school, University of London.

RICHARD JULIUS PUMPHREY, Ph D. Camb To continue his studies on the nervous system of cephalopods and on the auditory processes in insects At the zoological laboratory, University of Cambridge, and the laboratory of the Marine Biological Association, Plymouth

JUNIOR FELLOWSHIPS

VERNON HOLLIS BOOTH, Ph D. Camb. George Henry Lewes student, 1935–38 Ramsay memorial fellow for chemical research, 1938–39. Proposed research. (1) the analysis of internal constituents of bacteria with a wet-crushing mill, (2) carbonic anhydrase At the physiological laboratory, University of Cambridge

ERIC GEORGE LAPTHORNE BYWATERS, M B Lond, M R C.P. Assistant clinical pathologist, Middlesex Hospital, 1935–36, Rockefeller research fellow in medicine, 1937–38 Proposed research: rheumatoid arthritis At the British Postgraduate Medical School, University of London.

WILFRED INGRAM CARD, M D Lond, M R C P Since 1935 medical registrar and tutor to the medical unit, St Thomas's Hospital Louis Jenner research fellow at the hospital, 1938 and 1939 Proposed research: the inhibition of gastric motility and secretion by experimental studies on man At the medical unit laboratories and Sherrington school of physiology, St Thomas's Hospital medical school, University of London

HANS HELLER, Ph.D Prague, M B Camb Assistant to professor of pharmacology, University of Vienna,

1929–34 Proposed research the antidiuretic principle of postpituitary extract At the medical unit laboratories, University College Hospital medical school, University of London

MAXWELL SHAW JONES, M D Edin, D P H Walter Smith Kay research fellow in psychiatry, University of Edinburgh, 1934–36 Commonwealth Fund fellow, 1936–38 Proposed research insulin treatment of schizophrenic mental states At the Maudsley Hospital, University of London

BARNETT LEVIN, Ph.D Lond Fedler research scholar, Institute of Chemistry, 1931 32 Since 1932 lecturer in chemistry at Guy's Hospital medical school University of London Proposed research the effect of spatial configuration of antigens on immunological reactions At the clinical chemical laboratories of the London Hospital, University of London

IAN MACKENZIE, M B Edin, F R C S E Vans Dunlop scholar in bacteriology, University of Edinburgh, 1933 Rockefeller research fellow 1938 Proposed research immunological investigations on constituents of tumours At the department of surgical research, University of Edinburgh

ALEXANDER FRANCIS RAWDON SMITH Ph D Camb Senior student of the 1851 exhibition, 1936–37 and 1938–39 Rockefeller Foundation fellow, 1938 Proposed research congenital deafness At the physiological laboratory, University of Cambridge

BASIL ROLAND RECORD, Ph D Birm Department of Scientific and Industrial Research award, 1937–39 Proposed research the specific soluble substance found in the tissues in acute vaccinal infection At the Lister Institute of Preventive Medicine, University of London

All correspondence of fellows and candidates should be addressed to Prof T R Elliott, F R S, hon secretary, Beit memorial fellowships, University College Hospital medical school, University Street, London, W C 1

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

CHAIR OF MEDICINE AT DUNEDIN

Prof F H Smirk of Cairo has been appointed to the chair of medicine at the national medical school, University of Otago At present professor of pharmacology in the Egyptian University, and physician in the postgraduate section of the University Hospital, Prof Smirk was chosen from a large field Since graduation at Manchester in 1925 he has stuck closely to practical scientific medicine and research, working at Manchester, Vienna, University College Hospital, and Cairo His chief interest in recent years has been high blood pressure, but in the past he has worked at problems connected with heart and kidney

Dr D W Carmalt Jones and Dr F Fitchett, who are retiring at the age limit, have shared the responsibilities of the chair of medicine for twenty years They had endeared themselves to their students and will carry universal goodwill with them into retirement Their appointments were part time ones The new appointment is a full time one, carrying a higher salary than most other academic appointments in New Zealand

An urgent need in the Dominion is the development and better organisation of clinical teaching in the other three large centres—Auckland, Wellington and Christchurch—where students may go for their sixth, solely clinical, undergraduate year Postgraduate teaching also awaits development

MEDICAL EDUCATION

As a fitting conclusion to the recent postgraduate course conducted in Brisbane, Sir Alan Newton, senior surgeon at the Royal Melbourne Hospital, delivered the Bancroft oration on "The Making of Medical Men" He said that the number of medical students in Australia has greatly increased in the last few years, and in an attempt to discover the explanation an analysis has been made of reasons given by a group of students for choosing medicine as a career In 12 per cent of these parents insisted, 7 per cent found it the least objectionable of all the academic courses, 7 per cent took it up as an auxiliary hobby (such as being a medical missionary), 7 per cent followed in their fathers' footsteps, for 10 per cent it had been an ambition since childhood, and for 31 per cent it was due entirely to chance. With these figures in mind the natural inaptitude of a large percentage of students is not surprising, and Sir Alan suggested that some method of selection and elimination of the unfit should be instituted, based on the first year's work at the university In this way some control could be exercised over the quantity and quality of men entering the medical profession

In order to relieve the increasing tendency to overcrowd the curriculum he proposed that first year subjects should be delegated to schools and taught with English and history to form a cultural background, leaving the first year at the university for anatomy and physiology, that biology should also be taught in schools, importance being attached to principles rather than structural detail, that botany should be eliminated seeing that pharmaceutical preparations are now mostly in standardised form, that psychology, radiological diagnosis and pharmacology should also be omitted (this last being merged into therapeutics), that lectures on anæsthesia should be replaced by demonstrations, and that the time spent in studying the physiology of the special senses should be reduced Special subjects would then be taught after graduation On the other hand, he suggested that every medical school should have attached to it a medico social clinic with provision for students to visit the homes of patients so that they might understand their social and economic background and its relation to their physical condition

REFUGEE DOCTORS

In all the Australian states refugee doctors are now debarred from immediate registration as medical practitioners even though their qualifications and experience may be beyond all reasonable doubt In most cases applicants are required to graduate through an Australian medical school. These restrictions are designed, of course, not only to ensure that a foreign doctor is fitted to practise his profession in Australia but also to protect those already in practice from undesirable competition, and to safeguard the prospects of the younger men and women who are now qualifying At the same time it seems foolish for Australia to reject the medical knowledge skill and experience that are being brought in by refugees from Europe, especially as there is always a difficulty in supplying the medical requirements of remote country districts Legislation is under consideration in several states by which a system of regional registration would be instituted for foreign doctors who have the necessary qualifications This regional registration will allow a foreigner to practise only in a specified area It is proposed that certificates should be issued for one year only, subject to renewal at the end of that time After five years a foreign doctor would be entitled to seek registration among the general body of medical practitioners in the state

The British Medical Association maintains that,

since the shortage of medical practitioners in country areas is caused not so much by there being too few doctors as by the inadequate remuneration, these districts are as little likely to attract refugees as Australians. The local branches of the association contend that the proposed subsidy of £500 per annum is quite insufficient for any practitioner whether of foreign or British training, and that it should be increased to £1000 The association feels confident that there would then be a good supply of British practitioners for the country districts, but if not it would not object to foreign graduates filling the positions.

EXTENSION OF MATERNITY SERVICES

The institution by the health department of New South Wales of better medical facilities for mothers during the actual natal period opens up a new development in the state's maternity services. Extended antenatal and postnatal facilities have been available for some time The present scheme will cover the *vital* intermediate period It provides that the services of accredited obstetric consultants will be made available in any abnormal maternity case, irrespective of the financial circumstances of the patient; that a mobile blood-transfusion unit attached to one of the metropolitan hospitals will be established; that blood-donors will be paid at the rate of £5 per pint of blood; and that the whole of this cost, together with that of bringing in specialists, will be borne by the department of public health It also provides that every maternal death shall be reviewed within a reasonable time by a special committee, with a view to discovering any loopholes in the scheme and reducing still further the maternal *mortality*-rate.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENT)

MEDICAL CARE AND THE STATE

THE responsibility of the state for the provision of medical care was discussed at the annual conference of health officers and public-health nurses of New York state held in Saratoga Springs on June 27 and 28 Dr. E. S. Godfrey, commissioner of health, said that the impression he gained at the National Health Conference was that there is a vast social demand for a change in the method of payment and method of delivery of medical care, and that this demand will not be diverted by a distortion of factual material. He did not favour the Wagner Bill in its present form but not for the 22 so-called reasons promulgated by the American Medical Association. He believed that there should be a single federal authority, that the present procedure for obtaining grants should be simplified and that except for very broad purposes the appropriations made from the federal treasury to the states should be aggregated and that their segregation for specific purposes should be in the discretion of the administrative officer rather than in that of the Congress. In conclusion, he remarked —

"I have no desire to add fuel to a fire that is producing so much heat and so little light, but I do wish to voice at this time a resentment to the implication that men and women in public service are any less worthy, in education, in capacity, in attention, in interest, in devotion to duty, than those who are in what we call 'private life.' I resent the imputation that a salary stultifies, that we must receive a fee for every service rendered or else perform it grudgingly or inefficiently or both. This is no more true of the medical and the nursing professions than it is of those who are by established custom paid for their services in this way. Granted a satisfactory standard of living, the remaining satisfactions are not those derived from monetary income, but from an appreciation of work well done."

Assemblyman Lee B. Mailler pointed out that although the largest volume of medical services in New York state is arranged on an individual basis between doctor and patient the state does spend between 100 and 120 million dollars of its funds for the provision of medical care. He drew a distinction between the availability of medical resources and their utilisation. Services are available in a varying degree because of geographical or other physical barriers. They are utilised to a varying extent because of the more imponderable—but none the less real—economic, psychological or social barriers. Nation-wide surveys have shown that 4 out of every 10 people who are sick receive no medical care either because they *do not* ask for it, do not know where they can get it, do not know that they need it, or think that they cannot afford it.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

DEATH OF PROFESSOR YOUNG

ON the occasion of his retirement from the regius chair of surgery in the University of Glasgow and from his position as senior surgeon in the Western Infirmary Prof Archibald Young was last week presented with his portrait painted by James Gunn. His death on Sunday has only made the occasion more memorable. Sir George Mitchell, chairman of the Western Infirmary, sketched Professor Young's distinguished career and mentioned that he had been attached to the Western Infirmary for 37 years. Professor Young recalled the many changes which had taken place in the Western in his time. He remembered the time when members of the staff were hardly on speaking terms with each other Now the work of the hospital was better and the benefit to the patients greater for the improved liaison between members of the staff Healthy rivalry had also replaced the old sharp competition between the hospitals of the city. He asked the principal, Sir Hector Hetherington, to accept the portrait on behalf of the university. Sir Hector, in accepting, spoke of the successful manner in which Professor Young had upheld the traditions of the chair of Macleod and Macewan He was a man of strong individuality and—something all Scots respected—a bonnie fighter He imagined that there was hardly anyone present who had not at some time been Professor Young's opponent, but there was no-one with whom Professor Young had been brought in contact who had ever been his enemy. He was a man of great kindness, and nothing had been more characteristic of him than his zeal for the welfare of his students.

RETIREMENT OF COLONEL GREIG

Lieut.-Colonel E. D W. Greig, C.I.E., F.R.C.P.E., is retiring from the lectureship in diseases of tropical countries in Edinburgh University. For many years he has been a well-known figure in Edinburgh medical circles and at the Royal Infirmary, and his cheerful and good-natured presence will be missed The university, however, is to be further indebted to him, for it was announced at the last meeting of the

court that Colonel Greig [illegible] the University his collection of microscope slides, [illegible] photographs, and journals and books dealing with tropical medicine and hygiene.

MEMORIAL LIBRARY TO SIR DAVID WILKIE

In an address at the opening of the Wilkie Memorial Library in the Edinburgh [illegible] Secondary High School Yards, Edinburgh, Dr. T. H. A. Marshall, F.R.S. said he had known Sir David Wilkie as a student. There was a [illegible] which endeared him to all. He had a [illegible] a keenness and a joy in [illegible] he was essentially modest and almost shy about [illegible] which added to his charm. Dr. Marshall said he could speak of Wilkie as a colleague, as a member of the Medical Research Council, and as a friend. He referred to the great and untiring [illegible] which Sir David and Lady Wilkie had taken in the well-being of the work of the settlement. It is a reason [illegible] that funds have been raised for the improvement of the library and its facilities. After the cost of the work has been met a sum of money will be [illegible] for further additions to the shelves.

IRELAND

(FROM OUR OWN CORRESPONDENT)

ACTUARIAL INVESTIGATION OF NATIONAL HEALTH INSURANCE

ABSTRACTS of the report of a special actuarial investigation that has been made into national health insurance in Ireland were published last week. The investigation is distinct from the usual quinquennial valuations, and is intended to help to a judgment of the result that amalgamation of the approved societies has had on the working of national health insurance. It deals, therefore with the first three years—1933–37—following the establishment of the united National Health Insurance Society. The investigation has been carried out by Mr. G. S. W. Epps, of the general actuary's department, London. He has discovered some remarkable differences between the incidence of claims for benefit in Ireland and in Great Britain.

"It will be noted," says Mr. Epps, "that the disablement benefit claims in all three categories—men, spinsters and widows, and married women—range from twice to two and a half times the respective standards of the British valuation basis. Whereas the proportion of men claiming sickness benefit in Eire is only about one-half of that in Great Britain, the average duration of such claims is about 50 per cent. longer. In the case of disablement benefit, however, not only is the duration of claim about 15 per cent. longer, but the proportion claiming the benefit is more than one and a half times as many. Similar features appear in the case of women. As regards sickness benefit, the proportion of all classes is roughly three-quarters of the British proportion, but the average duration is 50 per cent. greater. In regard to disablement, the numbers of spinsters and widows claiming range from one and a half times to double the British figure, but the average duration is not much longer; in the case of married women, however, not only is the proportion claiming from two to three times the British proportion, but also the duration of claim is from 15 to 30 per cent., or more, longer, the disparities being most marked at ages under about thirty-five."

The report notes that in Ireland medical attendance for insured persons does not form part of the national health insurance scheme, provision being made only for the certification of incapacity [illegible] for the work. Whatever effect this absence of benefit for medical treatment may have on the health of the members, it is likely to lead to a considerable increase in the number of claims and, what is more to the point, prolongation of claims. The suggestion is made also that the relatively large proportion of spinsters who continue from Ireland may be a factor which tends to increase the proportion of claims among the small number of those who remain, as those who emigrate are largely drawn from the healthier section of the population.

It is clear that if the claims rate of the society generally [illegible] the amount of [illegible] in the insured population, then the provision [illegible] the financial basis of the system is [illegible]. If the finances of the scheme are to be regulated without abandonment of the principles which have hitherto governed national health insurance in both Great Britain and Ireland, there will then be an increase in the rates of contribution or a decrease in the rates of benefit, or both. Before arriving at such a conclusion however, the actuary remarks:—

"It would appear to be necessary to supplement investigations into genuineness of claims, suppression of claims, certification of continued incapacity, supervision of claims by the society, &c., to ascertain whether the present experience must be accepted as normal and adopted in the consideration of the financial basis governing the future operations of the society."

For several years past those interested in questions of health have been pressing on the government of Ireland the need for a thorough revision of the national health insurance system, and the establishment in connexion therewith of a system of medical treatment. There are inherent difficulties in such a development arising from the necessity for adjustment of a system of medical treatment of insured members with the present system of dispensary treatment for the poor. There is also, from the point of view of the government, the knowledge that any development will give cause for an increase in the state grant, and this difficulty is not diminishing. Again, there are some critics who hold that a system of health insurance directly administered by the state would be both more efficient and more economical than the present system of administration by a society under state supervision. How much and in what direction the actuary's report will influence future development is a matter of conjecture.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

BUDAVAR

Dr. Sulyok, leader of the national public health institute in Székesfehérvár, investigated some time ago the origin, course and treatment of mud fever. This disease was epidemic in some parts of Germany in 1926–27, and chiefly attacked labourers working barefoot in meadows. Typically, it has a sudden onset, with shivering or shuddering, great prostration, tormenting headache and photophobia; to these symptoms are added loss of appetite, nausea and tenderness of the abdomen on pressure. Now and then rashes appear, sometimes similar to those of morbilli or scarlatina or, more rarely, toxic spots as in typhoid. Fever usually rises to 104° F. and lasts for days. The cause of the condition is the *Leptospira gryppotyphosa*. When an epidemic was raging in

Germany, the disease occurred sporadically also in Russia Last year the disease reached Hungary, and at the Székesfehérvár institute several such typhoid-suspicious cases were reported, which gave negative results to all laboratory tests Although the whole course of the disease very much resembled the initial stage of abdominal typhus, yet all manifestations suddenly came to an end after the lapse of a week. It soon became clear that this was mud-fever. In one village, of 22 men making hay in a wet meadow, 7 fell ill with symptoms pointing to incipient abdominal typhus Their abrupt recovery after 8 to 10 days suggested to the parish doctor the possibility of mud-fever At the same time, in the county hospital in Székesfehérvár, private patients were suffering from a similar complaint. Among them were two physicians who both contracted the disease at a swimming-pool, where they took sun-baths lying on wet grass.

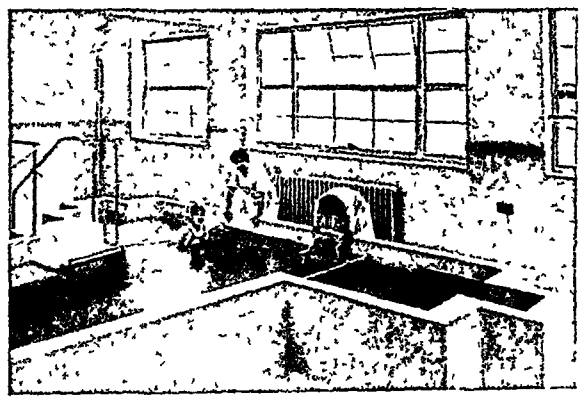
THE NUMBER OF HOSPITALS IN HUNGARY

In the ten years between 1926 and 1936, Prof Georg Gortvay reports a considerable increase in the hospitals of Hungary The number of state hospitals rose from 9 to 31, of clinics and midwifery centres from 33 to 36, of county hospitals from 37 to 41, and of private hospitals of public character from 29 to 41. Private hospitals in which the selection of patients admitted is left to the discretion of the management increased from 62 to 109 Hospitals maintained by the Misericordian Order increased from 4 to 5 The number of prison hospitals decreased from 29 to 24 The number of patients who attended all these institutions rose from 311,898 in 1926 to 584,809 in 1936.

STANMORE ORTHOPÆDIC HOSPITAL

OPENING OF NEW TREATMENT BLOCK

ON July 19 Mrs Walter Elliot opened the new treatment block at the country branch of the Royal National Orthopædic Hospital The hospital had its beginnings in an orthopædic dispensary founded in Bloomsbury by W. J. Little in 1838 which, after two years, developed into the first orthopædic hospital in London. The hospital soon moved to better accommodation in Hanover Square, and in 1845 when it was granted a Royal Charter became the Royal Orthopædic Hospital As interest in orthopædic surgery grew a second hospital was founded in Hatton Garden in 1851, and was called the City Orthopædic Hospital In 1865 yet another hospital was opened—namely, the National Orthopædic Hospital, which was built on the now familiar site in Great Portland Street. In 1905 these three hospitals amalgamated to form the Royal National Orthopædic Hospital In 1922 the hospital bought the Mary Wardell Home at Stanmore, and thus became its country branch. At first there were only thirty-four beds and all the work, operating and radiography, was done in the rooms of a Victorian country house. But the growth of the hospital has been phenomenal. There is now accommodation for 276 patients with a convalescent block for another 44, and a training college for 112 boys handicapped by some permanent crippling defect. With this rapid growth came the necessity for enlarging the facilities for physical treatment, and particularly for the victims of poliomyelitis who have been admitted in increasing numbers during recent years. The provision of a pool for under-water remedial exercises was considered essential; such pools exist in a number of hospitals in this country and have long been a feature of orthopædic hospitals in the United States and Scandinavia where poliomyelitis is a constant and serious problem. Their essential features are that they shall contain warm water and be easy to manage. The pool at Stanmore has been designed to make the task of the masseuses as light as possible The sides of the pool come well above floor-level, and there is a central deep trough for adult patients, and two bays for the treatment of infants. The corners of the bays are indented so that the masseuse can lean over the child without undue discomfort. The capacity of the pool is approximately 2500 gallons, the temperature of the water is maintained at 90° F. by thermostatic control, the circulation is continuous, and the water is filtered and treated with alum. Adjoining the pool are cubicles where patients may be sprayed with hot or cold water, dried, and given massage and exercises



R Fox

The pool for under-water remedial exercises

R Fox

The new treatment block

The block has cost £17,000 A donation of £5000 from the executors of the late Caleb Diplock enabled the work to be commenced It was their wish that the money should be devoted primarily to the construction of the swimming pool, and the committee of management decided at the same time to erect a larger building for all the departments dealing with physical treatment, though this has meant waiting until other funds became available

The other features of the treatment block are a large gymnasium which can also be used as a lecture-room, a light treatment room containing Hanovia lamps, a large massage room more than sufficient for the present needs of the hospital, a dental room (dentistry is an important part of treatment in long-stay cases), and a small lecture room which is also used as a pathological museum On the first floor is a large central linen room sufficient to contain the linen for the whole hospital There are over three hundred cupboards and each is aired by warm water circulating through pipes placed between adjoining cupboards, there is also a blanket store, sorting and receiving rooms

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations Each contributor is responsible for the section for a month, his name can be seen later in the half-yearly index

FROM A WOMAN PUBLIC HEALTH OFFICER

V

Some time ago I met what is technically known as a Lovely at a hen party The fact that it was a hen-party alone explains why the much photographed and paragraphed beauty confided in the likes o' me She had it appeared been electioneering for a boy friend with disastrous results "The Reds in that neighbourhood," she complained, "are a dreadful set They have secret meetings where they practise making up difficult questions to catch us, and anyone who makes up a question that *no one* can answer gets half a crown"

Even more successful than the Reds at this nefarious game, in my estimation, are the Young, especially the Young who are confronted prematurely by the great issues of birth or death On several occasions non medical parents, after introducing their offspring to the simple facts of reproduction, have offspring to the simple facts of reproduction, have referred them to me for the answer to any rashly referred them to me for the answer to any supplementary questions (in the parliamentary sense) Here are some of the queries—*ipissima verba*

From a little girl of 6 "How does God know for certain that a lady would be kind to a baby and really wants to have one? Of course He would never send a baby to a lady if she *didn't* want one, would He?"

From a small boy, just under 7 "Mummy says the muscle in the womb is like the muscle of the heart and acts without us telling it to Then how does the womb *know* when a baby is ready to come out and meet its Daddy?"

From another boy aged 7 "Mummy told me all about the way babies come but there is one thing I don't understand It sounds awfully uncomfortable Why do ladies do it?"

Can you blame me if I remembered with gratitude the base tactics of the Reds? Each child was hurriedly dispatched to the nearest Woolworth's—with a well earned half crown

* * *

High in the list of unanswerable questions pro pounded by those of riper years one would place the professional conundrum so often discussed in these columns full time service or private practice? Most of the writers seem to take the same view of full time service that Calvin Coolidge a preacher did of sin On the whole they are against it It would sometimes be easier to agree with their conclusions if they did not state their reasons Public medical services only exist because the country has found that certain things it wants are better supplied by communal effort So long as they were left to private enterprise they were either not done at all, or were badly or inadequately done That is a matter of medical history It does not logically follow however that the whole of medical practice would be better conducted by whole time officers Surely this is a purely empirical question to be settled by careful testing and experiment item by item, rather than by the doctrinaire pronouncements one hears from either side

As for the effect on the life of the doctor himself of whole time or private practice, it is difficult for me, as an Irish politician once said, to be either partial or impartial in this dispute Life is a series of compromises and we have all to decide which of the modes of life open to us will enable us to live nearest to our desire "Take what you like—and pay, says God" For many, a full time public service really does enable them to do the sort of things they want most, and at no heavier payment than any other choice would exact Probably the true reasons why one decided as one did are known only to our Creator and our Analyst (if any) and it is not necessary to pretend here that such reasons are always altruistic I can remember a fellow student at the Rotunda who was overheard lamenting to his mates that a constitutional dislike for leaving his bed left him with no alternative but to become a (?) M O H or marry a woman doctor who would take the night calls Sometimes however Youth is genuinely moved by an irresistible impulse towards what American health literature pompously calls Human Betterment, but may be more modestly described as tidying up the grosser muddles humanity has made for itself, such as slums or venereal disease It is even alleged that men have been drawn into the public service by a strange passion for statistics, satiable in no other way Or again by lazily taking the first chance that offers and without conscious plan at all

* * *

But having rightly or wrongly made the choice, what of the payment? "You surrender clinical interests," says one critic, but he is obviously out of date, for a state or municipal service may nowadays provide unrivalled chances for developing purely clinical or scientific bents—"You become callous and lose touch with the individual," says another Do we? Administrative work consists largely in seeing that obscure and helpless people get a fair deal, and in securing the rights of individuals who hardly know they possess them And if the critics think that they can do work under public bodies at clinics or hospitals and neglect the interests of the patients they had better not come and try—"You surrender

your freedom," says the voice that penetrates most clearly. Unlike the millions of our fellow human beings who inhabit the totalitarian states (and the few thousands whom I saw prostrating themselves in the Earls Court stadium one Sunday) we still consider that a reproach. My generation of youth believed that Freedom was a thing to die for and not a thing to trade for a coloured shirt. I am inclined to believe that British youth thinks so still It is altogether wholesome that there should be a dread of a slave status in any branch of the medical profession.

How far is the fear justified? Members of a highly organised profession must from the moment they register as students with the General Medical Council suffer restrictions on their liberty of action for the common good. Nor do the fetters fall off when one is qualified. I have no desire to emulate the author of "The Citadel," but do general practitioners —the chosen guardians of British liberty—never have to compromise to keep their patients and their appointments? As for the specialist, when we in the health services watch him staggering along the rolling English road to Harley Street via the voluntary hospitals, are we not sometimes moved to almost pharisaical thankfulness for our own lot?

* * *

Having decided, as we surely must, that every branch of medicine has its own perils, let us admit handsomely that the production of the yes-man is the great occupational risk of a full-time service. One knows how it begins A friend once told me that she could do no research in her school medical work, could not even become properly acquainted with local conditions, or follow individual cases. In her county the assistant school medical officer's duties were regulated by a clerk whose whole idea was to keep down travelling expenses. None of them ever protested . . . after one man had been sacked for doing so. If in subordinate ranks yes-man-ship leads to a wicked waste of opportunity, in the higher ranks it becomes a public menace There is no-one competent and available to do a big job when it is required, perhaps for the *national safety*, and the lay administrator is hoist with his own petard

An unpleasant variant of the yes-man is the official who adopts what has been described as the "racing-cyclist attitude." His back is bent to his superiors and his feet are busy treading down those below, and *sometimes* (in an ill-managed service) he may go far and fast. As we all recognise, the Jabberwock of whom we must beware is the Lay Administrator who would in time kill any service There is no reason why he should be given the chance. "What has that fellow got we haven't got?" is a fair question to ask, and we've got any amount of relevant knowledge and experience that he hasn't

* * *

What is the fundamental secret of this freedom? One of the Fathers of the Church has said that it is to learn such subordination of the senses to the spirit that one is able to act as one believes to be right on any issue and at any time. I recalled this definition vividly at the finest moving-picture I have ever seen—Paul Muni's Zola. On each of my three visits the audience thrilled to this abstract idea as I have never seen them moved by a love scene. You will remember that Zola who had known years of privation and fought his grim battles with entrenched privilege has won through to ease and honour And now comes a call to surrender everything and start all the battles over again, but equipped now with the tired body and brain of old-age instead of the urgent vigour of youth. He could respond as he did because he had never become a slave to his own success. That is the real freedom—and to this humble observer it appears as a rare treasure of the human spirit, hard to win and hard to retain whatever one's path in life.

Now I get back on the fence again—no doubt to the relief of the spectators—with an added respect for those who came before and greetings to those who come after.

Next month Doctor Don will be responsible for these columns.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 15, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1838; diphtheria, 836; enteric fever, 23 (51 "expected"); pneumonia (primary or influenzal), 508; puerperal pyrexia, 192; cerebrospinal fever, 33; acute poliomyelitis, 16; encephalitis lethargica, 1; dysentery, 32; ophthalmia neonatorum, 112. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 21 was 2900, which included. Scarlet fever, 777, diphtheria, 458 (carriers, 18), measles, 22, whooping-cough, 753; puerperal fever, 16 mothers (plus 8 babies), encephalitis lethargica, 306, poliomyelitis, 7 At St Margaret's Hospital there were 23 babies (plus 10 mothers) with ophthalmia neonatorum

Deaths—In 126 great towns, including London, there was no death from smallpox or enteric fever, 4 (0) from measles, 2 (0) from scarlet fever, 14 (3) from whooping-cough, 9 (0) from diphtheria, 26 (9) from diarrhœa and enteritis under two years, and 5 (1) from influenza. The figures in parentheses are those for *London itself*.

Manchester reported 3 deaths from whooping-cough Fatal cases of diphtheria were scattered over 7 great towns, Manchester reporting 3

The number of stillbirths notified during the week was 245 (corresponding to a rate of 37 per 1000 total births), including 41 in London.

THE LANCET 100 YEARS AGO

July 27, 1839, p. 650.

From a lecture at the Metropolitan Free Hospital by Mr P. Bennett Lucas.

Of the several ulcerations to which the tongue is liable, none are more likely to be confounded with each other than the cancerous and venereal, and this arises from the hardness which accompanies both; the hardness of the cancerous ulcer in this situation, as when situate in any other organ of the body, is, however, of the stony kind, whilst that of the venereal ulcer is more of the cartilaginous hardness, in the cancerous ulcer, also, the surface is very irregular, and presents granulations in one part, and in another a sloughy appearance, whilst the venereal ulcer is much less irregular, and presents the same kind of appearance for its whole extent There are other symptoms in both these diseases of the tongue which will guide us in forming a correct diagnosis; of these the occasional darting pain which accompanies the cancerous sore, and the rapid extension of the ulceration, when contrasted with the comparatively stationary condition and slighter irritation caused by the venereal ulcer, are very *characteristic*. The history of the symptoms which preceded the venereal ulceration, the presence of other venereal symptoms, together with the salutary influence which the exhibition of mercury almost *immediately* exercises over the venereal sore, are the most unequivocal guides to the surgeon

LETTERS TO THE EDITOR

DISTURBANCE OF MEMORY AFTER CONVULSION TREATMENT

SIR,—*Having read with great interest* the article by Drs G Tooth and J M Blackburn, in your issue of July 1, we should like to point out that we have been working on the same subject and our article was published in full in the *Zeitschrift fur das gesamte Neurologie und Psychiatrie* 1939, 166, No 1

We append a short summary of our results We in the Budapest University Hospital for Mental and Nervous Diseases followed up 1–4 years after treatment 419 cases of schizophrenia, comparing the cases actively treated with those not actively treated or treated by other methods We examined after treatment 85 cases with insulin, 50 with Cardiazol (Tetracor), and 132 cases which did not undergo active treatment The results may be thus briefly summarised

In the cardiazol group we had 23 8 per cent full and good remissions examined after treatment, in the insulin group 30 6 per cent, and in the untreated group 35 per cent Thus later examination showed that better results were obtained in the untreated group If we consider separately those later remissions which occurred more than 6 weeks after the treatment had been stopped and those which could not directly be ascribed to the active treatment, the actual figures for cardiazol are 13 per cent and for insulin 15 per cent

We must confess that these results are very depressing, the number of recoveries observed by us being no larger than before the introduction of cardiazol therapy

We are, Sir, yours faithfully,

LENOCZKY, HORÁNYI,
FSZENYI, BAK

Budapest Istenhegyi ut, 4/F, July 20

TRANSFUSION SYPHILIS

SIR,—There was a suggestion in your issue of July 15 (p 170) that there are many more cases of syphilis insontium than are revealed and a recent syphilis insontium than are revealed and a recent example was quoted of the conveyance of infection by blood transfusion An annotation of the same date in a contemporary[1] mentions the risk of syphilis being transferred from an infected donor to a healthy recipient That risk is a very real one, and, as far as can be ascertained, there are few blood-transfusion empanelling centres in which examination of volunteer donors for syphilis is carried out as a routine In a recent letter to the public press[2] Lord Dawson states "All that is required of volunteers now is a few drops of blood to enable a grouping test to be made" That, however, is not nearly enough At the time the grouping test is done the volunteer should undergo a thorough clinical examination by a syphilologist and a specimen of blood should be submitted to the Wassermann and Kahn tests Only after these investigations have yielded negative results in respect of syphilis should the volunteer be placed upon the list of *potential* donors Positive clinical or serological findings would exclude the volunteer as a blood donor When the time comes for any volunteer on the list to provide a specimen either for immediate transfusion or for storage, there should again be carried out a clinical and serological examination before the specimen is used

Since 1915 the following authors have reported cases of transfusion syphilis —

(1) Fordyce J A *Amer J med Sci.* 1915, 149, 781, (2) Bernheim, B M., "Blood Transfusion" London, 1917, p 62 (3) Brem, W V., *J Amer med Ass* 1923, 81, 852 (3 cases) (4) Spillman L and Morel V., *Bull Soc franç Derm. Syph* 1926 33 453 (5) Levy, I I and Ginsburg L, *Amer J Syph* 1927, 11 447 (6) Feldman, V., *Rev franç Derm Vénéreol* 1928, 4, 341 (7) Dufour, H., *Bull Soc méd Hôp Paris* 1929, 45 511 (8) Tzanck, A., *Ibid* Marshal, A., *Ibid* (9) Schuimann, L., *Prof méd franç* 1929, 3, 393 (10) Constantinescon E and Vatamann, N *Ann. Mal vénér* 1929 24 161 (11) Aubertin C and Fleury, J., *Bull. Soc méd Hôp Paris* 1930, 54 69 (12) Gougerot H et al *Ann Mal vénér* 1931, 26 174 (3 cases) (13) Polayes, S H and Lederer M, *Amer J Syph* 1931 15, 72 (14) Cordiviola, L A., *Sem méd* 1932 39 45 (15) Pinard M and Robert P, *Bull Soc méd Hôp Paris*, 1932 48 214 (16) Post, C D, and Cooney, G C *J Amer. med Ass* 1933, 100, 258 (17) Cummer C L, *Amer J med Sci* 1933 185, 787 (2 cases) (18) Williamson, G R, and Strong, R A., *Amer J Syph.* 1933 17 484 (19) Minami S and Asabi Fukuoka, *Derm Urol* 1933, 1, 27 (20) Moore, J E *Modern Treatment of Syphilis* Springfield 1933, p 456 (3 cases) (21) Pinard, M., *Bull Soc méd Hôp Paris* 1934 50 416 (3 cases), (22) Carnot et al, quoted in *J Amer med Ass* 1934 101 1773 (23) Garner V *Arch Derm Syph Wien*, 1934 30 480 (24) Jones, H W et al *Amer J Syph* 1935 39, 39 (4 cases) (25) Morgan, H J, *Amer J med Sci* 1935, 189, 808 (26) Perin, M L, and Lefevre, M *Bull Soc franç Derm Syph* 1935, 42, 954 (27) Mandelbaum, H and Saperstein A N *J Amer med Ass* 1936 106 1061 (28) Pautrier, L M *Bull Soc franç Derm Syph* 1936 43 503 (29) Klauder, J V and Butterworth T, *Amer J Syph* 1937 21, 652, (30) Rein C R, et al *J Amer med Ass* 1938, 110, 13

This gives a total of over 40 cases of transfusion syphilis occurring under peace time conditions, and probably a great many more instances have occurred but have not been diagnosed as such It is obvious that if, as Lord Dawson states, one out of every ten persons wounded in air raids requires blood-transfusion, the danger under war time conditions will be much greater unless measures are taken to eliminate syphilitic donors In most instances it would appear that the donors causing transfusion syphilis were in the latent phase of the disease and were unaware of their infection In some instances the donors were serologically negative, being in the pre chancre or incubation stage of syphilis

There are certain points to which I would particularly direct attention —

(1) The positive Wassermann test will detect only the most obvious risks of infection

(2) The presumptive precipitation test such as the Kahn should be the test of choice since it is more sensitive and more easily and quickly applied than the Wassermann in emergency

(3) A thorough physical examination, carried out by an experienced syphilologist, should be done on every donor before being put on the list and again before a specimen is taken for storage or immediate transfusion, in addition to a Wassermann and/or presumptive Kahn test

(4) Clinical examinations and serological tests done at intervals are valueless

(5) Donors should be carefully selected from persons of the highest moral and of satisfactory social status in order to minimise as far as possible the use of blood from a person in the incubation period of syphilis

In the annotation already mentioned it is stated "In any event, the risk (of syphilis) is borne by the recipient and not the donor" There are, however, several cases on record where the donor has been infected by the recipient owing to cannulas being inadvertently exchanged, and to other errors of technique With stored blood this danger ceases to exist but in all direct transfusions carried out in normal times for conditions such as haemorrhage or aplastic anaemia, the donor ought to be as well assured

1 *Brit med J* July 15 1939, p 121
2 *Daily Telegraph and Morning Post*, July 6 1939

of protection against accidental syphilis as is the recipient.

It would be interesting to have the medicolegal position with regard to these matters authoritatively clarified.

I am, Sir, yours faithfully,

E. T BURKE,
July 18 Director, L C C (Whitechapel) Clinic

*** Colonel Burke raises points of obvious interest and importance at a time when the possibility of blood-transfusions on the largest scale has to be envisaged They show, however, only one side of the picture, and perhaps overemphasise it. No person in imminent risk of death from hæmorrhage would hesitate to accept the very slight risk of infection, with syphilis or with any other infective disease, involved in a blood-transfusion, nor would any medical man hesitate to take that risk on his or her behalf That this risk should be reduced to a minimum all would agree, and Colonel Burke's letter is particularly valuable in emphasising that an adequate clinical examination, and a Kahn test, at *the time the blood is taken for storage or administration*, are a better safeguard than similar tests carried out weeks or months before, when a donor is enrolled. So far as an emergency permits we have no doubt that all possible precautions will be taken Any risk to the donor, as Colonel Burke is careful to point out, ceases to exist when, as in the present emergency scheme, all blood is taken into bottles for storage, or for indirect administration —ED. L

ORTHOPTICS

SIR,—In your report (July 15, p 135) of the Oxford Ophthalmological Congress I was not surprised to learn that members were divided in their opinions about the value of orthoptic training for heterophoria. I was, when in practice, well satisfied with the result of the treatment I adopted for this condition and very rarely had to resort to operation It is most important that treatment should commence as early as possible—this is much more easily done now that child welfare and municipal eye clinics are the rule.

After retinoscopy under atropine glasses are prescribed in all cases. These glasses should be worn constantly, not only during the day but at night as well I have never known a child having received any injury from this Young children generally awake much earlier than their nurses or parents and they pass this time with all kinds of ocular exercises If a squint already exists it is necessary to prevent amblyopia developing. The occlusion of the fixing eye is irritating to the child and can better be done by slightly smearing with vaseline or butter the lens of the fixing eye, taking care that the lens of the squinting eye is meticulously clean After instruction and explanation the mother or nurse carries this out A month or so of this treatment will soon improve the vision of the squinting eye; of course the vision of the fixing eye will suffer to some extent, but by alternating this treatment the equal development of each eye can be assured and the vision the same If with correction both eyes come to normal then the ordinary games and occupations will develop as much fusion sense as they are likely to get The strabismus disappears gradually, only to appear at times of mental excitement or bodily disorder.

I am, Sir, yours faithfully,

G. AUBREY JELLY.
Lytham, Lancs, July 20.

THE VACCINATION OF QUEEN VICTORIA

SIR,—In the note on Jenner as Royal Physician on p. 170 of your issue of July 15 you state that the vaccination of Queen Victoria in 1819 cannot be traced to him. Actually this vaccination was done by T. J Pettigrew, and is described in his Medical Portrait Gallery, vol iv, section Pettigrew, p. 15, as follows:—

"Upon the birth of the Princess Victoria, His Royal Highness (the Duke of Kent) was pleased to entrust to me, in conjunction with his domestic physician, Dr. (now Sir Isaac) Wilson, my old and much esteemed friend, the selection of a proper subject from whom the vaccine lymph for the inoculation of the Princess was to be obtained. This honour was conferred on one of the children of the late John Elliot, Esq., of Pimlico, who married a daughter of my dear friend, Dr Lettsom. I attended at Kensington Palace, and there vaccinated her present Majesty, to the entire satisfaction of her illustrious parents"

Vaccination, it should be remembered, in those days was from arm to arm, and it was extremely important that the child from whom it was taken should be free from hereditary disease That is why Dr Lettsom's grandson, Edmund Elliot, was chosen He died a lieutenant in the Madras Infantry in 1841, and there is a portrait of him on p 472 of my "Life of Lettsom" John Lettsom Elliot (1804–98), an elder brother of Edmund Elliot, held the infant princess in his arms when she was being inoculated from his baby-brother, and he was in the habit of describing this episode in his old age occasionally at the Athenæum, of which he was for years the last surviving original member. There is a wax medallion of him by Lucas preserved in the library of the club

The story of the vaccination was retold to Queen Victoria about the time of the Diamond Jubilee She was most interested, and it was arranged by Sir Lionel Cust that she and Lettsom Elliot should meet But nothing came of it. They were both too old and feeble by then.

I am, Sir, yours faithfully,

J. JOHNSTON ABRAHAM
Queen Anne Street, W 1, July 24

TRANSMEATAL ATTICOTOMY

SIR,—Mr. Tumarkin, in his article in your last issue (p. 189), is in error in saying that his operation of transmeatal atticotomy has apparently never been performed in England, although no doubt his assertion is made in all good faith. More than thirty years ago, when the old operation of ossiculectomy was becoming obsolete, I performed from time to time, in selected cases and with excellent results, an operation entailing the removal *per meatam* of the outer attic wall to drain the attic and allow of the removal of any granulation tissue present. It became clear to me that this comparatively simple procedure would in many cases save patients from the more serious radical mastoid operation and, in addition, ensure better preservation of hearing From that time onwards I have performed the operation in suitable cases, and it should in my opinion be deemed the operation of selection.

Mr Tumarkin may, with reason, ask why I have never published my results, and I once had a friendly argument upon this question with my friend Dan McKenzie My reason for silence was that a clinical assistant at the Royal Ear Hospital, whose experience was less than three months, essayed to perform the

operation, without consulting me, on a patient of his own He succeeded in dislocating the ossicles and injuring the facial nerve After this untoward event I decided it would be better not to publish any description of the operation, but to impart it only to those who could be trusted to perform it safely

I am, Sir, yours faithfully,

Harley Street, W 1, July 21 MACLEOD YEARSLEY

INSULIN RESISTANCE

SIR,—The problem of "insulin resistance" attracted attention almost as soon as insulin came into general use The term is not, unfortunately, well defined and may on the one hand be employed to include cases such as that of R ot in which the patient died in coma though taking 1686 units of insulin a day, and on the other the relatively resistant cases which are a commonplace of daily practice It is also applied to the transient resistance encountered in infections and to the resistance met with in thyrotoxicosis and acromegaly We presume that Professor Himsworth, in his last Goulstonian lecture, is dealing with the relative resistance to insulin shown by a large proportion of unselected diabetic patients

Himsworth states that in the diabetics the insulin sensitive and insulin resistant case are clearly differentiated by his insulin glucose test, and do not merge into each other This has not been our own experience Using the insulin glucose test, we have found every gradation from sensitive to resistant There is no reason to believe as Himsworth suggests, that this is due to infrequent blood sampling Two samples taken half and one hour after administration of glucose and insulin, the period during which the difference between the groups is stated by Himsworth to be most marked, should obviously suffice to determine the general direction of the curve and to differentiate, if this is possible, two clearly demarcated types This is obvious from the curves given by Himsworth himself Though in some diabetics insulin resistance may be permanent, we have shown that in others insulin resistance, as determined by the insulin glucose test, is purely transitory and may be converted by suitable dietetic measures to insulin sensitivity

Himsworth believes that the difference between the two types under the conditions of the test lies in the inability of the peripheral tissues of the insulin resistant diabetic to remove sugar from the blood, insulin sensitive subjects, on the other hand, showing a marked arteriovenous blood sugar difference He misinterprets the work of one of us when he states that he (W J G) found a difference in the peripheral insulin effect in the two types of sufficient magnitude to afford support for this contention Actually no significant indication of a difference in the peripheral response was found, and it was this fact that led us to conclude that the cause of the difference in the arterial blood sugar curves of the two groups in the insulin glucose test was to be sought for centrally—that is, in the liver storage

We are Sir, yours faithfully,

O L V DE WESSELOW,
W J GRIFFITHS

St Thomas's Hospital, S E 1 July 24

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS M P

THE decision of the Special Commissioners for Income tax that the sick pay of a member of a sickness annuity and life assurance society and of the Dentists Provident Society was assessable to income tax has already been the subject of a statement in Parliament by Sir John Simon Chancellor of the Exchequer Last week further questions were asked, but as the decision is now the subject of an appeal its implications were not fully dealt with The matter is one of interest not only to members of the medical and dental professions, although the decision was given in the case of a gentleman qualified as both doctor and dentist and practising as a dentist, but to every person who draws sick pay The decision on appeal must be awaited before further comment is made, but the facts of the case are interesting

The gentleman concerned originally joined a friendly society registered under the Friendly Societies Acts which at a later date became a company but continued to insure its members for sickness benefit on the same terms as those originally agreed The Dentists Provident Society to which the same gentleman also belonged has always been a registered friendly society In both cases the right of a member to receive sickness benefit depends on the continuance of the payment of subscriptions by way of premiums The member concerned has drawn sickness benefit since January, 1931, when he was incapacitated from following his profession as the result of an accident Each year since that time the member has returned a statement of his income to the Inland Revenue authorities and has included each year the amount of sick pay he received from both sources In October, 1938, the member for the first time received an assessment under Schedule D on this sick pay which was described as follows "From profits of trade &c of—Pensions" In November, 1938, the member received notices of assessment under Schedule D for each of the six years 1932–33 to 1937–38 inclusive

If the decision is upheld on appeal it will presumably apply to any sick pay for any period

* * *

Another matter which is now being considered just behind the parliamentary stage—by parliamentary advisers of some of the most important local authorities—is that of the conditions under which children are kept when "minded" for the day The child minded for the day is, of course, quite distinct from the foster child, whose interests are safeguarded by the child life protection clauses (in London) of the Public Health (London) Act of 1936 There is no obligation on the part of those minding children by the day to notify the fact that they do so, it is in consequence not possible to state how many of such minders there are nor under what conditions children are minded But some bad cases are known It is hardly likely that the total of minded children is less than half the number of foster children and there may be many more than that

The new parliamentary secretary to the Ministry

of Health is Miss Horsbrugh, who is known to be interested in this problem and it is to be hoped that she will activate this and other questions concerned with the health of women and children. Such activities are always welcomed by Parliament and Miss Horsbrugh has all-round good wishes in her new work.

* * *

Most of the parliamentary week has been taken up with war-risk insurance and kindred subjects related to the present disturbed international situation. But on Friday the Opposition had chosen the Home Office vote so that the matter of juvenile labour could be considered. The debate revealed the fact that there are still about half a million juvenile workers under 16 in factory employment. Of these there were 44,000 in trades connected with the cotton industry, where exemptions had been given by the Government for the children concerned to work forty-eight hours a week and 29,000 in the printing and book-binding trade for forty-five hours a week, the week in the last case being one of five days of nine hours each. The rest of the children will work forty-four hours a week. There was a curious far-off echo of ancient debates on the employment of infants in the cotton mills at the time of the industrial revolution. One member supporting the longer hours for children said that work in the cotton industry was found "particularly suitable for them Their employment in this work would help to train them and lead them into adult employment" Practically no one else took this view. Lady Astor asked: "Do you really suggest that the cotton industry cannot just as well engage children of 16 as children of 15?" Mrs Tate said that "if the welfare of an industry depended on the overworking of children the sooner it was wound up the better." Mr Wakefield said that cases of young people being employed for long hours were far too numerous. "The work of fitness and youth organisations," he said, "was being steadily interfered with because young people were too tired when they arrived at their clubs" Mr Tomlinson, the Labour M P. for Farnworth, said his father went into a cotton mill at 8 years of age, and he looked back himself to the days when "he attempted to find his way on the arm of his father, finishing his sleep as he went through the fields," to the factory, and wondered how people could manufacture a phrase and describe this as "beneficial employment"

The undesirability of long hours for girls of 14—the future mothers of the nation—and of spending large sums on education wasted by children going into industry too young, and many allied matters, were raised by speaker after speaker Fitness and health have become political questions of parliamentary importance. The House evidently agreed with Mr. Ridley when he said that they were dealing with children and should "completely disapprove of conditions for other peoples' children which they would not tolerate for their own"

Behind the fog of war, or rather of war measures in Parliament, an opinion is shaping which is ready for an extension of improved conditions at both ends of the wage-scale A raising of the age of entrance into industry would take many young people off the labour market, and an increase in old-age pensions, which has become a very live issue and on which Parliament debates this week, would take some more off at the other end.

Despite the Dictators things move.

FROM THE PRESS GALLERY

The Milk Industry

IN the House of Lords on July 21 the Earl of FEVERSHAM, parliamentary secretary to the Ministry of Agriculture, moved the second reading of the Milk Industry (No. 2) Bill, which has already passed through the House of Commons. Although this bill was necessarily limited in scope it was, he said, a further contribution to the main objective of milk policy—to increase the consumption of milk. Steps were being taken by the Government to secure that the greatest possible advantage was taken of the milk-in-schools schemes. As regards mothers and young children, although a scheme was introduced by the Scottish Milk Marketing Board early this year, it had not been possible to begin such a scheme in England, but agreement had been reached within the last few days with the English Milk Marketing Board as to the financial basis for such a scheme, and the board would submit a scheme at an early date This would provide for the supply of milk to local authorities for maternity and child-welfare purposes at 2*d* a pint, or 1*s*. 4*d*. a gallon, little more than half the ordinary retail price.

The development of the scheme would depend on the initiative shown by local authorities, and on the response of the mothers and children. It would be for the local authorities to prepare their proposals and submit them for the approval of the Ministry of Health. They would be able to authorise the supply of milk to the consumer free, for part payment, or at the reduced price of 2*d*. a pint The balance of the cost of any milk supplied at less than 2*d*. a pint would fall on local authorities' funds. The Exchequer grant until the end of September, 1940, would be sufficient to bring the board's returns on milk supplied under the scheme up to an average of 1*s*. 2*d*. a gallon on the year. The rate of any grant for the future would be reviewed before the end of September, 1940, in the light of the experience gained. It was proposed that the distributive margin on milk sold under the scheme should be not more than 8*d*. per gallon

The bill could, of course, only be regarded as an interim measure. Nevertheless, it provided for improvement in the quality of the milk-supply, which was an essential feature of a policy directed towards increasing milk consumption. The objective of permanent milk policy must be a self-supporting milk industry, assisted only so far as might be necessary to prevent the price structure from being undermined by competition from overseas.

The Earl of ONSLOW, Chairman of Committees, recalled the outbreak of typhoid on the south coast three years ago. He said that the corporation of Poole, very properly desiring to extend every protection to their inhabitants and visitors, brought in a clause in their general bill dealing with pasteurisation of milk. In the same session quite a different scheme was brought in by Glasgow. After some controversy the Government through Lord Halifax expressed the view that pasteurisation would be more properly dealt with in general rather than in local legislation. Lord Halifax had added that it was the intention of the Government to bring forward long-term legislation dealing with general milk policy in the near future. On that announcement the Poole clause was withdrawn and Glasgow dropped their bill That speech of Lord Halifax was made in April, 1937, but it was not until this spring that the first Milk Bill was introduced in the House of Commons. That bill included provision for pasteurisation, but the measure had had to be dropped and the present bill was only of an interim character. Lord Onslow asked what the Government's attitude would be if a local authority brought forward a private bill for next session dealing with pasteurisation on lines similar to those of the Poole and Glasgow bills

Lord LUKE said that the milk-control schemes had served a useful purpose, but hospitals had suffered

severely from them The cost of milk at the higher price they paid today as compared with 1932–33—the year before the milk control came into being—meant an expense of about £115,000 more per annum to the hospitals A hospital with 500 beds required at least 100 gallons of milk a day At present prices a quarter of the total cost of hospital provisions was for milk. The quantity of milk supplied to the hospitals was 7,000,000 gallons per annum out of a total of 1,100,000,000 gallons—under a 150th part of the whole milk scheme He was not asking for milk for the hospitals at the low price that butter manufacturers paid, but that the price should be reduced to what it was before 1932 Hospitals were not business concerns, and they could not raise their prices

The Earl of FEVERSHAM in reply said that the proportion of accredited and T T milk on the market was now 40 per cent of the total. Attested herds were producing over 50,000 000 gallons a year He agreed that if it was considered as a long term measure this bill would not be a satisfactory solution of the problems that confronted the milk industry There was no more justification for the provision of milk at specially cheap rates with Exchequer assistance to hospitals than for the provision of other essential requirements, such as gas, coal, electricity, bedding and medicine The fact that hospitals were doing beneficent work was surely not a reason why producers of milk should give them preferential treatment to the extent of selling milk at an unremunerative price The Milk Marketing Board had already granted such concessions as they usefully could. The question of pasteurisation was clearly unsuitable to be dealt with in a short-term bill of this kind, and he could not give any statement of the Government's view on the general question It was open to local authorities to promote private bills containing pasteurisation provisions and if they did so the Government would consider such provisions on their merits

Working Hours of Young People

In the House of Commons on July 21 a debate took place on the Home Office vote on the hours of employment of juvenile labour Mr RIDLEY said we moved with leaden feet in this matter With all the tremendous advances in technical productivity the most that could be done was to think of an eight-hour day for children of fourteen Conditions were permitted that required children of fourteen to rise at 5 45 in the morning when still overcome with sleep He had a youngster of that age, and for all the money in the world he would not permit that child to engage in a process of running its health by compelling it to wake up for arduous work winter and summer at that hour By the regulations the Home Secretary was depriving 38,000 young people of sleep and recreation They were too tired at the end of a day's work to cycle or swim What part could such young folk play in the national keep fit campaign?

Sir CYRIL ENTWISTLE said that there were many factors in the question of the employment of young persons Costs of production were important if an industry was to survive A committee which spent five days hearing all the evidence put before it was satisfied that the processes on which young persons were employed in the cotton industry were not injurious to their health It was true that no employment in a factory could be good for anyone, adult or young person, everyone would be better if they spent all their time in the open air All these matters were, of course, relative, but it was found that the processes on which these young persons were employed were not arduous in the sense of being heavy manual labour or imposing a strain on them—Mr TOMLINSON said he himself went into a cotton mill at eleven years of age / If it was prejudicial for children to work 44 hours it was prejudicial for them to work 48 hours It was all a question of degree of prejudice One did not say that because a man had been poisoned for 23 minutes but would die in 25 minutes therefore the poison was good for him for 23 minutes—Viscountess ASTOR said there must be something radically wrong with an industry if it depended on children of fourteen working 48 hours a week If she had gone into a cotton mill at eleven years of age, or a child of hers had done so, the Red Flag would not have been red enough for her Of all the countries in the world we ought to look after our juveniles in view of our falling birth-rate—Mrs TATE said the girls who were going into industry at fourteen were the future mothers of the nation Whether they were going to be perfect for motherhood depended perhaps more than anything else on how they were treated between the ages of twelve and eighteen—Mr SEXTON suggested that a major factor in the reduction of accidents was the increased age of entry into industry, and that was a powerful argument for keeping children at school until they were fifteen—Mr MACQUISTEN said that 8 hours a day was too long for young people to work, and the half time system would be much better for them The foundation of national welfare was a healthy well-paid population, and people must not be overworked The Home Secretary should reconsider these regulations—Mr COVE said that if he liked the Home Secretary could take a strong line on this question and say with the backing of the House of Commons that 44 hours was the maximum time which these children ought to work.—Mr WAKEFIELD said that the work of fitness and youth organisations was being steadily interfered with because young people were too tired when they arrived at their clubs We ought to see to it that our young people were given reasonable opportunities after their hours of work of building up their mental qualities, developing their physique, and being able to play games and continue their education

Mr RICKARDS, speaking as managing director of various textile firms, said that if these regulations were passed they would not make 1 per cent difference to the young people going into the industry What was damaging Lancashire far more was the malnutrition consequent upon low wages, and the main reason for that was foreign competition

Mr PEAKE, under-secretary, Home Office, replying to the debate, claimed that the legislation passed since 1933 showed that the Government was not unsympathetic to the claims of juvenile workers It could not be said that certain industries had made use of the rights given to them by Parliament to claim exemption under section 71 of the 1937 act in regard to the employment of young persons for 48 hours a week An industry had to pass through a very narrow mesh of conditions to secure that exemption In a large number of cases an inquiry had been refused because a prima-facie case was not made out Altogether about sixty representations had been made by relatively important bodies in respect of more or less distinguishable industries, and a considerable number from individual firms and smaller groups of employers There were three cases in which regulations had been recommended and had already been issued in draft These regulations provided that the longer hours should only apply to those who had reached fifteen years and upwards, except that those at present employed should continue in the present hours In two other cases the recommendation of the court had been in favour of making regulations and these would shortly be issued in draft In the case of one of these, the textile bleaching and dyeing industry the same provisions as to hours had been made In the other case, that of printing and bookbinding, the recommendation was that only one extra hour should be worked a week—45 in place of 44—by all juveniles under sixteen The number of young persons employed in the five industries in respect of which draft regulations had been made or were going to be issued was between the ages of fourteen and fifteen 29 000, and between fifteen and sixteen 44,000—a total of 73,000 That was out of a total of about 500 000 juvenile workers under sixteen in factory employment He claimed that the administration by the Home Office of section 71 of the act had been fair and judicial

QUESTION TIME

JULY 20–26

M. & B. 693

Dr. SUMMERSKILL asked the Minister of Health whether he would state the chief considerations which led him to refuse to allow the drug popularly known as M & B 693 to be generally used by medical practitioners for patients who were treated under the National Health Insurance Acts.—Mr. ELLIOT replied: It is not correct that I have refused to allow M & B. 693 to be used for the treatment of insured persons. Insured persons are entitled to this remedy in all cases in which practitioners responsible for their treatment consider that it is advisable. Prescriptions for M. & B. 693 have been given to insured persons ever since the drug came into use. I greatly deprecate the suggestion that permission to use this remedy has been refused, as it might lead to medical practitioners withholding it in cases where it would be of use. The suggestion may thus prejudice the chances of recovery of insured patients. No possible question even as to accounting can arise save in the small number of cases where the doctor receives a capitation fee for himself dispensing drugs, and then, if he considers that the cost of using this remedy is more than should be borne by his capitation fee receipts, he may apply to the Minister for sanction for a special payment. This also has been allowed in a number of cases.

Dr. SUMMERSKILL: Is it not a fact that the Minister was asked if he would put this drug on the special list of expensive drugs by the committee which deals with national health insurance work and that he said he could not allow that, but that in a year's time, when the price of the drug was reduced, he would reconsider it?—Mr. ELLIOT: No, the hon. lady has no right to say that at all. I have given the reasons for my answer. I say that this drug is available, always has been available, and always will be available for insured persons and the suggestions that it is not are totally unfounded and, what is more, dangerous to the health of the insured public.—Dr. SUMMERSKILL. I must protest. (Cries of "Order.") May I ask whether the Minister will give me a direct answer "Yes" or "No," whether he did not refuse to put this drug on the special list at the request of the British Medical Association, and is it not a fact that in the current issue of the journal of the British Medical Association there is a statement that the minister has refused to put it on the special list and will reconsider it in a year? Can I have an answer "Yes" or "No"?—Mr. ELLIOT. Certainly. I have refused to put it on the special list because it is obtainable under the ordinary arrangements for insured persons; and I have refused to put it on the special list because arrangements are made for dealing with these things separately. It is a matter of accountancy. The suggestion that this drug is withheld from insured persons is quite unworthy of the medical profession.

Dr. SUMMERSKILL asked whether the Minister was aware that manufacturing chemists possessed a monopoly of certain drugs, and by charging prohibitive prices prevented poor patients from receiving the most modern form of treatment, and whether, in the best interests of the community, he would take steps to remedy this.—Mr. ELLIOT replied: If the hon. member will give me particulars of the drugs which she has in mind, I shall be happy to look into the matter.

Dr. SUMMERSKILL. Is the Minister aware that the drug I have in mind is the drug I referred to in my last question, which he has refused to put on the special list, and which is being sold on the market at 7*s*. 6*d*. for 25 tablets, and because he has refused to put it on the special list it is being sold at a prohibitive price and is therefore unavailable for poor people?—Mr. ELLIOT. I think I have dealt pretty thoroughly with the hon. lady's suggestion, and I am perfectly willing to consider the question of these drugs if she will bring the facts to my notice. But, as I am informed, the actual cost of this drug is 4*d*. per dose, and not the figure which she gave.

Blood-transfusion Services

Mr. MANDER asked the Minister of Health whether the forms and other registration documents as used in the organisation of the emergency blood-transfusion services in the London area could be made available for the provinces, and whether, in order that the expense might not fall entirely upon voluntary organisations, financial and other assistance might be made available for the organisation of these services in the provinces as well as in London.—Mr. ELLIOT replied: I hope to be able to give some financial assistance, where necessary, towards the work of testing and registering blood donors in some of the main centres in the provinces. Forms and other registration documents similar to those used under the arrangements for London would be made available for the provinces.

Captain PLUGGE asked whether when the first supplies of transfused blood were exhausted additional supplies would be obtained on a similar system of bulk collection, or whether those registering for transmission would be required to travel to different parts of the metropolis or the provinces for the purpose of blood-transfusion.—Mr. ELLIOT replied: The arrangements which are now being made are for selecting and registering donors of blood, and these volunteers will not be asked to give any blood unless and until an emergency arises. Their services will be required at the places where they have been registered, or, if they have moved, at the nearest hospital where the blood is being collected.

Medicine Advertisements in Stamp-books

Sir ARNOLD WILSON asked the Postmaster-General how many stamp-booklets had been issued, or prepared for issue, containing an advertisement of a proprietary medicine which promised immediate results to sufferers from rheumatism, backache, painful joints, and affections of the kidney, bladder, and prostate gland, on what date the existing contract for this advertisement would terminate, and whether his department had sought any expert advice as to whether or not it was in conformity with the restrictions proposed by the Select Committee of 1912.—Major TRYON replied: The answer to the first point is 10½ million, to the second, that there is no standing contract, and to the third, in the negative. Advertisements which specifically purport to cure any of the diseases mentioned in paragraph 58 (2) of the Select Committee's report are rejected. As the Assistant Postmaster-General stated in answer to a question on June 28, I am looking further into the policy of the Post Office in this matter.

Sir A. WILSON asked if the Postmaster-General would canvass the Government departments and the marketing boards with a view to pointing out the great opportunities offered to them by the space in these booklets.—Major TRYON said that the whole matter was being considered.—Mr. HARVEY asked if the right hon. gentleman would consult the Minister of Health on the matter of these advertisements.—Viscountess ASTOR: If you cannot advertise a cure for cancer, why can you advertise a cure for all these complaints?—No further reply was given.

Inoculation and Dental Treatment of Militiamen

Mr. NAYLOR asked the Secretary of State for War whether it was intended that militiamen should be subjected to inoculation and/or vaccination, and whether they would be given the option of refusing *without* penalty.—Mr. HORE-BELISHA replied: Militiamen will not be compulsorily inoculated or vaccinated.

Captain ELLISTON asked whether, except in cases of urgent emergency, militia recruits requiring artificial dentures might be directed to secure treatment in the manner authorised by the National Health Insurance Acts—namely, by obtaining dental letters from their approved societies for presentation to any registered dentist.—Mr. HORE-BELISHA, Secretary of State for War, replied: Militiamen reporting sick on dental grounds during training will receive any necessary *treatment* from the army, free of charge, including artificial dentures when they are essential. While under training they will not be eligible for dental benefits under the National Health Insurance Acts. Those militiamen who were insured persons under the National Health Insurance Acts before being called up for service will continue to be insured throughout their training, the whole of the contributions being paid from army funds. They will, therefore, re-enter

civil life in exactly the same position with regard to dental benefits in their approved societies as if they had remained in insured civil employment

Foreign Doctors

Mr GEORGE STRAUSS asked the Home Secretary whether, in view of the shortage of doctors that would arise in the time of war, and the serious results of that shortage in the treatment of air raid casualties and the morale of the civilian population, he would consider increasing the number of work permits to well qualified refugee German and Austrian doctors.—Mr PEAKE, Under Secretary, Home Office, replied: After consultation with representatives of the medical profession permission has been given to a certain number of foreign doctors who have come here as refugees to practise or to take appointments in this country, but there is a limit to the number of foreign practitioners who can properly be absorbed in the medical profession. The information my right hon. friend has as to the present position does not suggest that there is any such shortage or prospective shortage of doctors as would warrant any large addition to the number of foreign practitioners.

Insurance Benefits and Income-tax

Mr BENN asked the Chancellor of the Exchequer under what statutory authority an income tax assessment was made on benefits paid to persons under the National Health Insurance Acts.—Sir J. SIMON replied: Benefits under the National Health Insurance Acts are not regarded as constituting income, and consequently as attracting income tax. There is no express definition of "income" in the acts but the above view has always been maintained in administering the acts.

Milk in Industries Scheme

Mr ROBERT GIBSON asked the Minister of Agriculture how many firms had taken advantage of the milk in industries scheme, how many workpeople, men and women, respectively were employed by those firms, how many of these took advantage of the scheme and if he would give the names of the larger firms that had recently joined the scheme.—Sir REGINALD DORMAN SMITH replied: I am informed by the National Milk Publicity Council that at the end of June this year 7123 firms in England and Wales were taking advantage of the milk in industries scheme. These firms employ 2,237,500 persons, but I am unable to say how many of these actually take milk under the scheme. A similar scheme is organised by the Scottish Milk Marketing Board in its area and I understand that about 1200 firms are taking advantage of it. While I cannot say how many persons are employed by those firms, I am informed that about 60,000 people are consuming milk under the scheme. As regards the last part of the question, I am told that the scheme has recently been adopted in England in the Vickers Armstrong works at Barrow in Furness and in the Imperial Chemical Industries works at Billingham, and in Scotland by Messrs. Barclay, Curle and Co. and Messrs. Stewart and Lloyds, both of Glasgow, and by Messrs. Redpath, Brown and Co. of Edinburgh.

Milk for Civil Servants

Mr ROBERT GIBSON asked the Minister of Health whether negotiations for providing milk for civil servants in Whitehall had been completed, what arrangements had been made for the distribution of milk, when the arrangements would come into operation and at what times of the day the milk would be available, and how many civil servants would be able to avail themselves of the scheme.—Mr ELLIOT replied: So far as my department is concerned arrangements are being made as indicated in the question by the departmental Whitley council through the National Milk Publicity Council. The delivery of milk will be between the hours of 10 and 11 A.M. to such of the staff as wish to participate. The date agreed provisionally for the commencement of the scheme is Sept. 4.

Pithead Baths

Mr CAPE asked the Secretary for Mines how many mines were equipped with pithead baths up to the end of June, 1939, the districts covered, and the number of men and boys provided for in these baths.—Mr GEOFFREY LLOYD replied: 287 pithead baths with accommodation for 361,732 men and boys and 760 women had been completed up to the end of last month. They are distributed equitably amongst all the coalfield districts, as shown in the published List of Pithead Baths (1939 edition), a copy of which I am sending to the hon. member.

Sulphanilamide Preparations

Mr JOHNSTON asked the Secretary of State for Scotland to what extent the circular letter of Feb. 16 1938, from the Department of Health for Scotland had stimulated a more extended use of sulphanilamide preparations for streptococcal and urinary infections, and if he had any information as to the hospital bed accommodation which might thereby be made available for war emergency purposes.—Mr COLVILLE replied: The use of these preparations by the medical profession in Scotland is, I am informed, increasing, but some of the newer derivatives particularly are still in the experimental stage. The answer to the last part of the question is in the negative.

Infectious Disease at Anti-aircraft Camps

Sir THOMAS COOK asked the Secretary of State for War what arrangements had been made to deal with possible outbreaks of infectious disease at the anti aircraft camps at Weybourne and Stiffkey and other War Office establishments in Norfolk.—Mr HORE BELISHA replied: Arrangements have been made for cases of major infectious disease to be admitted to civil isolation hospitals, and for cases of minor infectious disease to be admitted to the Military Hospital, Colchester.

Pharmaceutical Services in Army and R.A.F.

Mr THORNE asked the Secretary of State for War if he would consider setting up a committee, under the director-general of Army Medical Services, with the object of organising an efficient pharmaceutical service for the Army and the Royal Air Force.—Mr HORE BELISHA replied: My right hon. friend the Secretary of State for Air and I are both satisfied that the dispensing requirements of the Army and the Royal Air Force are adequately met by existing arrangements.

Production of Antitoxic Sera

Mr LYNCH asked the Secretary of State for War whether, in view of the valuable work rendered by army horses, he would prevent the sale of those horses no longer fit for active service to manufacturing chemists to be used for the purpose of producing antitoxin.—Mr HORE BELISHA replied: The production of antitoxic sera is a work of the utmost national importance, and I am advised that cast army animals are for technical reasons, the most suitable for this purpose, and the process involves no cruelty to the animals.

Treatment of Disabled Ex-Service Men

Mr BURKE asked the Minister of Pensions how many disabled ex-Service men had received treatment by the Ministry of Pensions during the last twelve months, and of these how many received special full treatment allowances, as laid down in article 6 of the Royal Warrant.—Sir W. WOMERSLEY replied: The number of disabled ex-Service men who received treatment at one time or another in the course of the twelve months ended June 30 1939, was 13,013 including 5637 cases in mental hospitals. The records of my department do not enable me to give the precise information asked for in the latter part of the question, but it may be taken that in the great majority of cases full treatment allowances were payable.

"An old English physician has written 'It is allowed that our first master Hippocrates never showed more wisdom and greatness of mind than in confessing his mistake in taking a fracture of the skull for the natural suture.' Hippocrates put that mistake on record, but we are not told that he made the confession of it to his patient. A doctor may hide his mistakes from his patients without loss of truth, but he must never conceal them from himself."—Prof. CHARLES MCNEIL addressing graduates of the University of Edinburgh on July 19.

MEDICAL NEWS

University of Cambridge

At recent examinations the following candidates were successful :—

D M R E

Part I—R D Howat and S R Reynolds
Part II—H N Bhatt, J P Bostock, Frederic Bush, F M Crawshaw, W G S Harden, T M. Hennebry, C W Horncastle, K A K Kassem, C F MacGuire, S A Maddocks, R T Marshall, G F Rees-Jones, Zoë C Rutherford, Eric Samuel, Ida B S Scudder, and W E M Topping

University of London

At recent examinations the following candidates were successful :—

M S

Branch I (Surgery)—F R Kilpatrick, Guy's Hosp.; W R Merrington, B Sc, Univ Coll Hosp, and J E Spalding, Guy's Hosp
Branch III (Ophthalmology)—C J F. Blumenthal, Guy's Hosp

Dr. W. G. Barnard has been appointed to the university chair of pathology at St. Thomas's Hospital medical school.

Dr Barnard is 46 years of age He began to study medicine at the London Hospital, but his studies were interrupted by his war service in France in the Field Artillery for two years He was gazetted out of the Army in 1917 in order to qualify, and in 1920 obtained the M R C S, L R C P After holding a clinical appointment at the London Hospital he worked in the pathological institute there, becoming junior assistant director of the institute From 1923 to 1931, he was pathologist to University College Hospital and lecturer in morbid anatomy and curator of the museum in the medical school; during this period he worked for six months in 1927 as voluntary assistant to Professor Aschoff in Freiburg In 1931 he was appointed consultant histologist to the London County Council and pathologist-in-charge of the Council's central histological laboratory at the Archway Hospital He has examined in pathology for the Conjoint Board for the past three years Dr Barnard was elected to the fellowship of the Royal College of Physicians last year He published a textbook entitled "Elementary Pathological Histology" in 1928 and has written many other papers on pathological and medicolegal subjects

The title of reader in medicine in the university has been conferred on Dr E F Scowen in respect of the post held by him at St Bartholomew's Hospital medical college.

Dr. R M. Calder has been reappointed to the Graham scholarship in pathology for a further period of one year.

Applications are invited for the William Julius Mickle fellowship of the value of at least £200. It will be awarded by the senate to the graduate of the university, resident in London, who has done most to advance medical art or science within the last five years. Further information will be found in our advertisement columns

University of Edinburgh

At a graduation held on July 19 the address to the new graduates was delivered by Prof Charles McNeil. The following degrees and diplomas were conferred :—

M D—P C Davie, †H L deWaal, I J Freedman, J A Guy, Robert Hardy, F D Hart (*in absentia*), * J S Jeffrey, J A M'Lauchlan, ‡W M. Millar, ‡R A. Miller, A R M Moir, J M Rogan (in absentia), Maud I Smith, and *Harry Stalker
C M—‡C F W Illingworth

† Awarded gold medal for thesis
‡ Highly commended for thesis
* Commended for thesis

M B, Ch B—W J Abel, Catherine J. A Aitken, Han Ap Thomas, M W Archdall, G W Baker, G W Balfour, Beatrice M Bartlet, Murdoch Beaton, Thomas Black, James Borrowman, Anne E Boyd, D K Bradley, G A R Brown, H M Brown, Kathleen M Buchanan, D W Burton, C S Campbell, I D Campbell, William Carruthers, T S Chalmers, A J Clarke, J C Comline, Leonore S Cooke, Monica de S Craig, W G. Cuthbertson, N M B Dean, P R Dickson, Morag Dods, Glenys M M Donaldson, K J Dunlop, F C Edington, A W B Edmunds, I N J Eggeling, J S Elliot, A F El Shahed Ruth A J Evershed, C D Falconer, C W A Falconer, William Falconer, Jean E Fleming, G M Forsyth, W H Galloway, Maxwell Gardiner, Elizabeth Gemmell J W Gibson, W W A Gibson, Agnes J M Gilruth, *R H Girdwood, C A Glendhill, A M Glen, Patricia E Goddard, W W Gordon, Sarah H Graham, L S Grant, J S Gray, Constance I. Hardy, James Harper, A B Hegarty, A G S Hill, D W Horn, Kathleen I Hughes, Ethel J Kay, J A Key, D J Kirke, B D Kohli, G R Kulkarni, W R Lamb, N A Lamberty, Anne M Lander, T W Leeds, W I Leslie, R E S Lewis, Anne H Lockie, A M Loughran, Jean M M Lyon, Catriona C M'Callum, Betty P M'Clements, M P M'Cormack, Mary B M'Donald, R M MacDonald, E C MacFadyen, J D M'Gregor, A S M'Kenzie, L M Mackenzie, Margaret D R Mackinnon, Isobel J M'Larty, Gilbert MacNaughtan P C M'Neil, J O F Macrae, M M. Macrae, Elizabeth M L MacWatt, Archibald Main, S E O Martin, H S Marwick, A K M Mazhar, J B. Menzies, Nancy S M Milne, J M Muir, V V Muir, D. F. Mungall, J A L Naughton, W. W Park, J L M Parnell, I D Paterson, Hugh Pattinson, S S Pavillard, H J B Pershad, W B Preston, N H L Pringle, Margaret E Quin, A S Qunta, A. R Ralley, G J. Ralston, G W Reid, J H Robarts, A A C. Ross, D F Ross, John Rutherford, J C B Serjeant, R P Seymour, D W Shannon, T R Simpson, S. A Sinclair K A Sleem, Mora A Smeaton, A M Smith, W L Smith, Randal Stalker, G D F Steele, William Storrar, Catherine M Sutherland, G B Tait, A W. O Taylor, A C P D Thomson, A M Turnbull, A J Varga, Ekkehard von Kuenssberg, Andrew Walker, D G Walker, G B. Walker, H W Whitelaw, G R Wightman, W. C Wightman, I D Willatt, D E Williams, T G Wilson, G B Young, and W K Young

*With honours

B Sc—G W A Dick, M B, and William Forbes, M B (with first-class honours in pathology)
D P H.—G F Anderson, C E S Bailey, D W Graham (in absentia), Alison M B Hamilton (in absentia), Betty C Hamilton (in absentia), M S Khan, R B Lucas, Edith M Martin, R M Ross (in absentia), Jasmine Taylor (in absentia), and R M. White (in absentia)
D T M & H—H L de Waal, Thomas Evans, and Joan F M E Lamplugh
Diploma in Psychiatry—S I Ballard, Kathleen B Cobb, J J M Jacobs, W W Laughland, James Leckie, Antranig Manugian, W M Millar, and R M Young
D M R—W. N Brown, and Joseph Phelan

The following awards of prizes were made —

Cameron prize in practical therapeutics to Gerhard Domagk, Elberfeld, in recognition of his discoveries which initiated the treatment of diseases of bacterial origin by compounds belonging to the sulphonamide group; Ettles scholarship and Leslie gold medal, R H Girdwood, M B, Scottish Association for Medical Education of Women prize, Leonore S Cooke, M B; Mouat scholarship in the practice of physic, D W Burton, M B, Buchanan scholarship in midwifery and gynæcology, Betty P M'Clements, M B., James Scott scholarship in midwifery and gynæcology, Leonore S Cooke and Nancy S M Milne, M B; Dorothy Gilfillan memorial prize, Glenys M M Donaldson, M B, Conan Doyle prize, D W Burton; Beaney prize in anatomy and surgery, Keith memorial prize in systematic surgery, Royal Victoria Hospital Tuberculosis Trust gold medal, and Wightman prize in clinical medicine, R H Girdwood, Annandale gold medal in clinical surgery, Leonore S Cooke; Murdoch Brown silver medal in clinical medicine, Glenys M M Donaldson, Sir Robert Jones prize in orthopædic surgery, Constance F Hardy, M B; Sir Humphry Rolleston prize, Maxwell Gardiner, M B, Marchison memorial scholarship in clinical medicine, A J M Drennan, M B; M'Cosh bursaries, James Innes, M B, and F H. Robarts, M B., Vans Dunlop scholarship in public health and clinical therapeutics, I A G MacQueen, M B, Gunning Victoria jubilee prize in bacteriology, in therapeutics, and in child life, and health, H L de Waal, M D, J D Allan, M B, and R. A Miller, M D, respectively; Thomson memorial medal in child life and health, R. A. Miller, Wellcome medals and prizes in the history of medicine, H L de Waal and Sarah H Graham, M B

Royal College of Physicians of Edinburgh

A meeting of the college was held on July 18, with Dr. Alexander Goodall, the president, in the chair. Dr Basil George Tonge Elmes (Nigeria) and Dr. Alistair Gibb Stevenson (Durban) were elected to the fellowship

Royal College of Surgeons of Edinburgh

At a meeting of the college held on July 21, with Mr W. J Stuart, the president, in the chair, the following were admitted to the fellowship :—

Robert Randolph Mutrie, M D, Queen's Univ, Kingston, George Alexander Hay Adam, M B Glasg; Henry Israel Baigel, M B Cape Town; Arthur Fawcett Miller Barron, M D Edin, Thomas John Beresford, M B Melb, Arthur Bickford, M D Man, Willem Christiaan Botha, L R C P E, William Scott Charlton, M B Sydney; Sidney Joel Cohen, M B Witwatersrand, David Hunter Cummack, M B Edin Tulsi Das, M B Punjab, Edmund Were Dorrell, M R C S; Gordon Walter Duncan, M B Lond, John Woodward Hannay, M R C S, Edward Spcld Jamieson, M B N Z, Beatrice Mary Joly, M D Lond; Marcus Matthew Kennedy, M B, Sydney, James Tait Laurenson, M B N Z, Donald McIntosh, M B Edin, Ronald Duncan Macrae M B Aberd Kenneth Ian Macrosson M B Glasg, George Brown Mair, M B Glasg., William Alfred Mort Marrow, M R C S; Mahmuda Ghulam Mohamed M B Punjab, Frederick Thomas Moore, M R C S, Horace Gordon Page, M B Edin, William Mathias Quin, M B Edin, Harold Roche Robertson, M D McGill, John Mannix Robins, M R C S, John Alfred Shepherd, M D St And, Max Leonard Slotover, L R C P I, Kenneth James Talbot, M B N Z, Jacob Jozua van Niekerk, M R C S, and Edwin Perry White, M D, Queen's Univ, Kingston

Naval Medical Compassionate Fund

At the quarterly meeting of the directors of this fund, held on July 14, with Surgeon Rear-Admiral C V. Griffiths, deputy medical director-general of the Navy, in the chair, the sum of £66 10s was distributed among the several applicants

Society of Apothecaries of London

At recent examinations the following candidates were successful —

Surgery—M G Braham A N Coondoo M E Davies, E A Griffiths, I M Monare C E S Myers, C J Pollard D Pryser-Jones W E Roden and W N Vellacott

Medicine—C V Arthur, J J Brenner A N Kalra, S T Nakib, C J Pollard S A Schuyler W Simpson and A T M Wilson

Forensic Medicine—C V Arthur, N F Bishai, J J Brenner, A N Kalra S T Nakib, C J Pollard S A Schuyler, W Simpson, S Smith, and A T M Wilson

Midwifery—D Gallivan J N Hunt A G McPhillips, N A St C Marley, T Owen C J Pollard and D Pryser Jones

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery and midwifery —

C V Arthur, St Mary's, N F Bishai, Birm and West London, A N Kalra Univ Coll Hosp I M Monare, Roy Colls, Edin C J Pollard, Lpool and West London, S A Schuyler Charing Cross W Simpson St Mary's, and S Smith, Manc

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on July 22 Prof W Fletcher Shaw was re-elected president, and Mr Eardley Holland and Prof Miles Phillips were elected vice presidents The following officers were also elected hon treasurer, Dr J P Hedley, hon curator of museum, Mr Alcock Bourne, hon librarian, Mr Frederick Roques, and hon secretary, Mr G F Gibberd

The following were admitted by the president —

Fellowship—Douglas Hamilton MacLeod (London)

Membership—J L Cameron (London) W M Capper (Bristol) Anthony Charles (London) Alice E Dickie (London), and C M Hopkins (Australia)

The following were elected to the membership —

R I Ritchie (New Zealand) B H Anderson (Melbourne) A W Andison (Canada), G W Blomfield (Leeds), D R Cairns (London), W D A Callam (Edinburgh), D G W Clyne (London) Gilbert Dalley (London) D S Greig (London), T N Hart (Bolton), William Hawksworth (New Zealand), W M Lennon (Melbourne) G G Lennon (Birmingham), F H Lord (Melbourne), Ruvin Lyons (Canada), T A Macfarlane (New Zealand) D M W Maxwell (Windsor) Shivaprasanna Misra (Calcutta), C W Salisbury (Sydney), Everall M. Shippam (London), Richard de Soldenhoff (Lyme Regis), P A Thomas (India), G B Thomas (Lahore), S L Townsend (Melbourne) J D Watt (Romford) and Lila Windeyer (Sydney)

National Radium Trust

Mr E S Hill has been appointed secretary of the Trust in place of Mr R Stanton, who has resigned the secretaryship on his promotion in the Ministry of Health

London School of Hygiene and Tropical Medicine

On the results of the D P H examination the Chadwick Trust prize has been awarded to Dr R C Wofinden On the results of the D T M & H examination the Duncan medal has been awarded to Dr R J Riddell and the Lalcaca medal to Dr D A Cannon

Prize-giving at the Middlesex

On July 20 Sir Edward Mellanby K B S presented the prizes gained at the Middlesex Hospital medical school at the Queen's Hall Mr S A Courtauld, chairman of the school council presided, and Prof W B Tuck delivered an address on the chemical elements Dr H E A Boldero the dean said that for the whole year the work of the school had been carried on under the shadow of a national emergency The Government plan for the treatment of casualties had its advantages as regards clinical teaching in that Middlesex physicians and surgeons would be attached to the various hospitals of sector 5, and students would be able to go to the same hospitals The preclinical students who had done two terms of anatomy and physiology would go to a university in the west of England and their teachers would go with them It had been a remarkable year he said in the way of research, striking work having been done at the Bland Sutton Institute under the leadership of Professor McIntosh, on M & B 693 and at the Courtauld Institute, under the direction of Professor Dodds on stilboestrol The new block of school buildings was nearing completion and would be ready for occupation at the beginning of next term A sum of £20 000 was still needed to pay for the new buildings

University College Hospital

The Bilton Pollard fellowship has been awarded to Dr M L Rosenheim

Postgraduate Orthopædic Course in Paris

A postgraduate course on "technique chirurgicale concernant l'appareil moteur" will be held at the Faculty of Medicine in Paris from Oct 16 to Nov 4 The lecturers will include Prof L Ombrédanne and Prof Paul Mathieu Further information may be had from Prof Mathieu at Hôpital Cochin, Paris

National Hospital, Queen Square, London

Two courses of lecture demonstrations on neurology will be held at this hospital, one from October to December and one from January to March Further particulars may be had from the dean of the medical school

International Council of Ophthalmology

Prof J Meller (Vienna) has been nominated president of the next congress of the council, which is to be held in Paris in 1940 on the day before the opening of the annual meeting of the Société Française d'Ophtalmologie The main subjects for discussion will be plastic operations on the eyeball and the pathology of retinal detachment An international standard for the determination of the axes of astigmatism will also be considered at the congress

Royal Society of Medicine

The Royal Society of Medicine has made the ninth award of the William Gibson research scholarship for medical women to Miss Diana Kinloch Beck, who is working at the Radcliffe Infirmary, Oxford, for her proposed research on the cerebral vascular system in relation to cerebral aneurysms and their surgical treatment

Royal East Sussex Hospital, Hastings

At a meeting on July 11 the general committee of this hospital decided to close one large and three small wards, and seven clinics in the outpatient department The hospital has an overdraft of over £36,000 and an ultimatum has been received from the bank that this must be reduced by £2500 by the end of the year The money can only be found by revising the ordinary expenditure Special arrangements have been made in the outpatient department to deal with members of the benefident fund and other contributory schemes, and the agreements with local authorities will also be unaffected by the changes A special committee has been formed to launch an appeal for funds Last year's income was £28 000, a further £6000 will be required annually if the wards and clinics are to be reopened

International Congress for Radiology

The sixth International Congress for Radiology will take place in Berlin from July 31 to Aug 4, 1940 General subjects proposed for discussion include special methods of examination in radiological diagnosis, and the development of therapeutic methods, their achievements and the demarcation of their indications A series of lectures will describe the present state of knowledge as regards the effect of rays on the living cell, and the development of radiophysics The congress will also meet in the following sections radiological diagnosis; radiotherapy; radiobiology physics and technique; and electrology and light Further information may be had from the secretary general, Prof W Baensch, Liebigstrasse 20 Leipzig, C 1

University of Basle

On the occasion of the inauguration of the new university buildings the honorary degree of M D was conferred upon Dr Max Hartmann of St Gall, chief of the research laboratories of the Ciba works at Basle It was Dr Hartmann's interest in the chemical aspect of biological problems which inspired his activity in the field of chemotherapy and led him first to the discovery of the properties of Coramine, then to the isolation of the hormones of the corpus luteum, and more recently to the isolation of substances regulating arterial tension Two derivatives of this latter group are now available for clinical use The medical faculty of Basle has recognised the high scientific standard maintained in the chemo pharmaceutical research laboratories which has enabled them to render great service both to practical medicine and the advancement of medical science

OBITUARY

WILLIAM ALEXANDER POTTS

M.A CAMB., M D EDIN. AND BIRM

Dr W A. Potts, who died on July 23 at his home in Edgbaston, Birmingham, at the age of 73, will be chiefly remembered in his capacity as psychological adviser to the Birmingham justices. It was in the year 1919 that Mr. Gerald Blesley, deputy chairman of the Birmingham bench, suggested that a physician with expert knowledge of psychiatry should be attached to the court with whom the justices could take counsel. The suggestion was based on the example of Chicago where in 1914, at the instance of chief justice Harry Hobson, a psychopathic laboratory was instituted under the direction of W J. Hickson which demonstrated the utility of psychiatric assistance in deciding on the treatment of offenders. Later that year the prison commissioners appointed Hamblin Smith whole-time medical officer to Birmingham prison and Potts was attached to the court to advise where accused persons were remanded on bail or charged on summons. Thereafter, when an alleged offender was suspected of being mentally abnormal, the court agreed to postpone action until a full medical inquiry had been made Potts was regularly to be seen about the police-courts offering advice in a difficult case and more formal evidence under mental-deficiency procedure To the casual glance he was cold, aloof and official in manner but the dour exterior scarcely hid a gentle and painstaking spirit, anxious to relieve human distress

[Whitlock, Birmingham

By education and upbringing Potts was singularly qualified for his task Coming of a well-known family of brass-founders in Birmingham, his father was a schoolmaster and he was himself trained to be a pedagogue until his father's death when he was 23 left him free to study medicine He had been head-boy at Fettes under his father's headship, had taken honours at Emmanuel in the mathematical tripos, and had taught at Bilton Grange, Rugby He won a Thomson bursary to Edinburgh and after qualifying in 1895 was house-surgeon to William Annandale, after which a year spent at the East Riding mental hospital gave the turn to his career, for he discovered there that the mentally defective was not unamenable to moral suasion. After further resident experience at Edinburgh he went into partnership at Edgbaston with W. S Mann, whose third daughter he married in 1899 They had four sons, one of whom is now a doctor and one a schoolmaster. He had twenty years in busy general practice, becoming physician to the Maternity Hospital and lecturing on pharmacology in the University, and these years confirmed his growing interest in the mental and physical equipment of the adolescent and its effect on conduct

When the Royal Commission on the care and control of the feeble-minded was constituted in 1904 and it was decided to make regional investigations into the incidence of feeble-mindedness in the general population in selected areas, Potts was chosen to carry out this survey in Birmingham and neighbourhood Through the enthusiasm of Mrs Hume Pinsent, Birmingham had done pioneer work, before the 1899 act, in the education of feeble-minded children, and in due course Potts became chairman of the special-schools aftercare committee, where he was closely associated with G A Auden The commission's report led to the Mental Deficiency Act, 1913, and it was then that Potts's long experience and detailed knowledge marked him for medical adviser to the Birmingham mental-deficiency committee—an appointment which he held until within a few weeks of his death His energies were not confined to the routine duties of this office; he was in request as a speaker and lecturer, whether to teachers on the springs of delinquency or to parents on the adventure of adolescence. He collaborated with G E Shuttleworth in the later editions of "Mentally deficient Children," his chief contribution being the chapter on the psychopathies of puberty and the severance of juvenile delinquency from the hazy notion of moral imbecility He also acted as adviser to the Great Barr Park colony and to the mental wards of the Hallam Hospital Later he became consultant to the Royal Albert Institution at Lancaster and the Tavistock Clinic in London Everywhere he was a courteous and kindly colleague who did his duty with a full sense of his responsibilities to the individual under examination and to the public whom he served —and this in spite of increasing physical disability from progressive osteo-arthritis

Dr. Freize Stephens writes: "To those who met Dr. Potts for the first time in the last ten years of his life his unfailing courage must have been a source of continual admiration, for often, when obviously racked with pain, he would insist on going a tiring journey to comfort some patient who had consulted him, or to attend a medical meeting on some topic dear to his heart, or to support a young colleague reading his first paper to a learned society's gathering, and on all those occasions to the anxious inquiry of an older colleague would come the challenging reply. 'There's nothing wrong with me. I'm all right—quite all right' It was the same spirit of defiance which stood him in good stead in those early pioneering days that he devoted so ardently to the welfare of the mentally defective and juvenile delinquent. His courage and his gentle forbearance of ignorance and ridicule were the outstanding characteristics of his life; he would never accept defeat, and when all seemed lost he would quietly marshal his forces again and march them on to an abiding success Today we appreciate and value the results of those achievements in the surer understanding of the problems involved, in the better provision for the institutional and community care of the feeble-minded, and in the humane clauses of the Criminal Justice Bill—we appreciate these successes and forget the disappointing delays, the long and tedious discussions, the patient bouts with wilful misunderstanding and dull authority, and the interminable and often most unnecessary investigations and inquiries which eventually led to those triumphant results. In the light of what has happened it is interesting to note that Potts was successively a schoolmaster, an assistant medical officer in a mental hospital, a general practitioner of over twenty-years standing, and the chairman of the aftercare committee of the special schools of Birmingham before he decided to enter

the civic arena in order to gain statutory recognition for his psychological ideals So long and patient an apprenticeship was surely worthy of a great psychologist, and a great psychologist he was without a doubt Many an honour he received testified to this fact but his most treasured possession was the gratitude of his poorest patients, outcasts of the city, to whose homes a visit from Dr Potts made a day of splendid memory He too delighted in those visits, and to the end they remained his happiest activity"

HUGH NEVILLE TAYLOR

M A, CAMB, M D DUBL, I R C S E

Dr Neville Taylor died on June 28 at Newport, Mon, whither he had retired three years ago from his life work at Ebbw Vale Born at Coltcshall, Norfolk, and educated at Oundle, Taylor gained first class honours in 1883 in the natural sciences tripos at Cambridge and went on to Edinburgh where he qualified in 1891, later taking the F R C S E After a further period at Trinity College, Dublin, he settled in practice at Llandovery About 30 years ago he accepted appointment as surgeon to the Ebbw Vale general hospital which was then run by the workmen's medical society of which he became president This venture, which was at first in the nature of an experiment, was attended with remarkable success and Taylor gradually extended his sphere of influence in the neighbourhood On the death of Dr J W Davies he became medical officer of health and school medical officer under the urban district council, which he induced to appoint a separate committee for health and sanitary matters Under his direction many important improvements took place including a reorganisation of the water supply After giving up his official position he was elected to the council for the central ward, securing 1438 out of a total of 1500 votes, having conducted his election campaign without outside help He soon became chairman of the health committee and also of the parliamentary committee Early in his professional life Dr Taylor married Ethel Winifred Hughes Morgan and together they worked without ceasing for the betterment of one of the most distressed areas in the country Some revival of industry has now come to the valley and it was a satisfaction to Taylor that he lived long enough to see the beginnings of that revival.

Taylor was a barrister at law and medical referee for the Ministry of Pensions, during the war he served with the rank of major in the R A M C (T), and in his early days he contributed a number of clinical notes on interesting cases to the medical journals His position at Ebbw Vale came under some criticism from colleagues who could not fail to recognise not only his great ability but also his high ideals and sense of professional ethic

WILLIAM EDMUND COOKE

M D LIVERP F R C P

Dr Cooke, director of the pathological department at Wigan Infirmary, and an authority on diseases connected with coal mining, died suddenly on July 20 at Euston Station He was the son of Luther Cooke and was born at Aspull, Wigan, in 1881, being educated at Bullingham Ampleforth, and Liverpool University, where he took his M B in 1904 During the years before the war his main interest was in tuberculosis After a time at Walthamstow sanatorium he was head of Ochil Hills sanatorium and Coppins Green industrial sanatorium, doing some original work on the pathology and radiology of phthisis He took the D P H and the M R C P L in state medicine in 1913, and during the war was first in charge of the isolation hospital at Aldershot and later served in Egypt On his return he took over the pathological and bacteriological work at Wigan Infirmary, becoming also consultant pathologist to various sanatoria and borough councils in the neighbourhood and hon medical adviser to the Wigan mining and technical college Dr Cooke was responsible for the section on anthracosis, asbestosis, and kindred conditions in the Encyclopædia of Medical Practice

PANEL AND CONTRACT PRACTICE

Militiamen and Territorials

THE Minister of Health has decided that although militiamen are not entitled to medical benefit during the period of their service with the forces their names will not be removed from the lists of their insurance practitioners Any question of reinstatement on discharge to civil life will not accordingly arise The necessary financial adjustments are being effected centrally by reducing the amount of the medical pool Officers and men of the reserve and auxiliary forces who are called up for service and were previously insured will continue to pay contributions at the full employed contributor rate during their period of service, and will remain entitled to all benefits Insurance practitioners must accordingly be prepared to provide treatment for any such men included in their lists who may need it The period of service in the Territorial Army, the Royal Naval Volunteer Reserve and the Auxiliary Air Force will be about a month, and in the Army Reserve the Royal Fleet Reserve and Air Force Reserve about three months

Expensive Drugs

The Minister of Health, as we report on another page, denied that he had refused to allow M & B 693 to be used for the treatment of insured persons He was asked if it was not a fact that when he was requested to put this remedy on the special list of expensive drugs he had said that he could not allow this but in a year's time when the price of the drug was reduced he would consider it Mr I Hall replied that this drug is available, always has been available and always will be available to insured persons, and the suggestions that it is not are totally unfounded and, what is more, dangerous to the health of the public

The main point is whether practitioners who dispense for insured patients must provide this drug as part of their obligation or whether they should be allowed to make a supplemental charge on the ground of its expense According to the report of the June meeting of the insurance acts committee the Minister had been asked to include M & B 693 or any approved substitute in the list of drugs appended to the second part of the distribution scheme This list serves a twofold purpose It sets out the drugs and appliances which may be either prescribed by or supplied by practitioners who ordinarily issue prescriptions and it is also a list of drugs and appliances which if supplied by a dispensing doctor are not regarded as falling within the quarterly payment,

now 7½d per patient. Thus a doctor is entitled to be paid for any of the items included in this list which he supplies to his patient whether he is a prescribing or dispensing practitioner. The departmental view was that it was unlikely that the present price of the preparation would be maintained and therefore the question should be deferred for twelve months, but it was added that the Minister had in the past given and would continue to give favourable consideration for special payment in respect of the supply of the preparation.

Vacancies

For further information refer to the advertisement columns

Ashton-under-Lyne, Lake Hosp —Res obstet O, £350
Bedford County Hosp —First and second H S, at rate of £155 and £150 respectively
Birmingham City Education Committee —Asst school M O, £500.
Birmingham, Dudley Road Hosp.—Jun M O, at rate of £200
Birmingham, Monyhull Colony Mental Deficiency Institution —Med supt, £1000
Bristol Royal Infirmary and Bristol General Hosp —Locum tenens, at rate of £500
Bristol University —Asst lectureship in pathology, £300
Bucksburn, Aberdeenshire, Rowett Research Institute —Head of physiology department, £800
Cardiff, King Edward VII Welsh National Memorial Association Three half-time asst. tuberculosis O's, each £250 Also asst res M O for Sully Hosp, £200
Chester, Barrowmore Tuberculosis Sanatorium and Settlement, Great Barrow —Jun asst M O, £200
Chester City Hosp —Jun. res M O, at rate of £150
Derbyshire Education Committee —Asst school M O., £500.
Dorchester, Dorset County Hosp —H S, at rate of £150
Dorset County —M O H, £800
Dover, Royal Victoria Hosp —Two R M O's, each £140
Dudley, Guest Hosp —Res surg O, at rate of £250–£300 Also H S, £150
Dumfries County Council —County bacteriologist, £650
Durham County Hosp —H S, at rate of £150
Elizabeth Garrett Anderson Hosp, Euston Road, N W 1 —Hon asst anæsthetist, 10 guineas
French Hosp and Dispensary, 172, Shaftesbury Avenue, W C 2. Res M O, £100
Golden Square Throat, Nose and Ear Hosp, W 1 —House anæsthetist, £150
His Majesty's Colonial Service —Two health officers for British Guiana, each £650
Huddersfield Royal Infirmary —Cas O, at rate of £200
King Edward Memorial Hosp, Mattock Lane, Ealing, W.13 —Cas O and H S, at rate of £150
Liphook, Hants, King George's Sanatorium for Sailors —Asst. M O, at rate of £200
Liverpool University —Demonstrator in physiology, £300.
London Chest Hosp, Victoria Park, E 2 —H.P., at rate of £100
London Hosp, E 1 —Surgical first asst and reg, £300 Also first asst and reg to ear, nose and throat depts, £150
London University, W C 1 —William Julius Mickle Fellowship, £200
Malda Vale Hosp for Nervous Diseases, W 9 —H P, at rate of £100
Maidstone, West Kent General Hosp —H P and H S, each £175.
Manchester, Christie Hosp and Holt Radium Institute, Withington Res M O, at rate of £150
Manchester, Royal Children's Hosp, Pendlebury —Res surg O and asst M O for outpatients' dept, each at rate of £150
Manchester Royal Infirmary —Jun asst M O for radiological dept, £350 Also asst M O for massage and electric dept, £100
Manchester, Saint Mary's Hosps —Res obstet O for Whitworth Street Hosp, £150 Asst res obstet O for Whitworth Street Hosp and jun res anæsthetist, each at rate of £100
Middlesbrough County Borough —Deputy M O H, £750
Newcastle General Hosp, Joint Committee's Clinic —H S. and jun clin asst, £250
Newcastle-upon-Tyne Hosp for Sick Children —H P and two H S's, each at rate of £100
Newcastle-upon-Tyne, Royal Victoria Infirmary —Res M O, £350 Also sen accident room H S, £150
Newport, Mon, Royal Gwent Hosp —Cas O at rate of £175
Portsmouth Royal Hosp —Cas. O, at rate of £130
Prescot, Whiston County Hosp —Sen res M O, £100
Preston, Sharoe Green Hosp —Jun asst res M O, at rate of £100
Queen's Hosp. for Children, Hackney Road, E 2 —H.S. and cas. O, each at rate of £100
Reading, Royal Berkshire Hosp —Res anæsthetist, at rate of £250 Also res M O, at Blagrave Branch Hosp and asst to pathologist (combined post), at rate of £150
Rotherham County Borough —Asst M O H, £600
Royal Army Medical Corps —Vacancies
Royal Eye Hosp, St George's Circus, S E 1 —Sen H S and two asst H S's, at rate of £150 and £100 respectively
Royal Free Hosp, Gray's Inn Road, W C 1 —Clin asst in gynæcological dept Res cas O, at rate of £150 Also first asst in children's dept, £100
Royal Naval Medical Service —Medical officers
St Mary's Hosp, W 2 —Jun asst radiologist, at rate of £75.
St Thomas's Hosp, S E 1 —Temp res asst physician, at rate of £225
Sheffield City —Asst tuber O for Winter Street Hosp, £350
Sheffield, Royal Infirmary and Hosp —Res H S to ophth dept, at rate of £80–£120
Southampton Children's Hosp and Dispensary for Women —Res. M O, at rate of £150
Southampton, Isolation Hosp and Sanatorium —Jun res M.O, £200
Southampton, Royal South Hants and Southampton Hosp —Sen H S, £200 Also res anæsthetist and H S to general surgical and ear, nose and throat wards, each at rate of £150.
Torquay Borough —Deputy M.O H and asst. school M O, £600
Truro, Royal Cornwall Infirmary —H P, £120
Wakefield City —Jun asst M O., £500
Walsall General Hosp —Res surg O, £300
West Riding of Yorkshire County Council —Asst bacteriologist, £650

Appointments

AINSCOW, C B, M B Manc, assistant school medical officer for Derby.
BODKIN, KATHLEEN M, M R C S, D P H, assistant medical officer of health and school medical officer for Hendon.
BULL, J W D, M B Camb, M R C P, D M R, hon radiologist to the Maida Vale Hospital for Nervous Diseases
CLIFF, MARGUERITE E, M D Manc, D P H, senior assistant medical officer of health for Staffordshire
COLLINS, G H., M B Glasg, junior assistant medical officer at the Isolation Hospital, Romford
COPE, R W, *M R C S, D A, anæsthetist to the Chelsea Hospital* for Women
CRIDLAND, NIGEL, B M Oxfd, D O, hon consulting ophthalmic surgeon to the Bognor Regis War Memorial Hospital
*DAVIES, D O, M B Lond, F R C S, resident surgical officer at the Crumpsall Hospital, Manchester
EVANS, BARBARA D. F, M R C S, assistant pathologist at the Elizabeth Garrett Anderson Hospital, London
*EVANS, W. G, M B Camb, D P H, medical officer of health and school medical officer for Canterbury
JAMES, URSULA, M B Lond, *medical registrar at the Elizabeth* Garrett Anderson Hospital, London
LAURIE, EDITH, M B Edin, D P H, assistant medical officer of health for Stirlingshire
LEYSHON, V N, M B Lond, D P H, assistant medical officer *of health for Bristol*
MCLEOD, G L, M B N Z, resident medical officer at the Royal Northern Hospital, London
NEWNS, G. H, M D Lond, M R C P, assistant physician to the Princess Elizabeth of York Hospital for Children, *London*
PEET, E W., M B N Z, F.R C S, hon assistant surgeon to the ear, nose, and throat department of the Radcliffe Infirmary, Oxford
PRATT, J S, M B Camb, resident medical officer at the City Hospital, Chester
REID, A C, M B, outpatient officer at the Royal London Ophthalmic Hospital
ROSS, H. J T, L R C P E, assistant resident medical officer in the tuberculosis section of the public health department, Birmingham
STALLWORTHY, J A, M B N Z, F R C S, M R C O G, hon assistant obstetrician and gynæcologist to the Radcliffe Infirmary, Oxford
STANFORD, SYDNEY, M B Lpool, junior assistant medical officer at the *City General Hospital, Plymouth*
THOMPSON, S M, B Chir Camb, F R C S, surgical registrar at the Stanmore branch of the Royal National Orthopædic Hospital, London
WHITE, R. A, M R C S, resident *medical officer at the King* George Hospital, Ilford
WILSON, A. H, M B Aberd, D P M, medical superintendent at Meanwood Park Colony, Leeds
WISEMAN, D C, M B. Glasg, resident medical officer at the City General Hospital, Leicester
WOODWARD, V. J, M B Lpool, D P H, assistant county medical officer of health for Derbyshire

* Subject to confirmation

". . The bad psychological effects of overcrowding of passengers will place a limitation on the size of long-range transport airplanes, it was reported at the San Francisco meeting of the American Society of Mechanical Engineers . The most crowded condition is represented by a trip of six people in a small motor-car. About 114 cubic feet of space is available, or about 19 cubic feet per person. This is tolerable only for a group of friends or relatives with common interests and then only because the scenery is changing very rapidly near-by the car. High overhead in an airplane the scenery frequently is monotonous except on those particular flights which may traverse a mountainous region Over-ocean flying is notoriously monotonous after the first few hours It is probable, according to experts, that 19 cubic feet of space for each passenger is the lower limit at which passengers can be attracted to aerial transport."—*Science* (suppl), July 14, 1939, p 8

NOTES, COMMENTS, AND ABSTRACTS

HOLIDAY RESORTS AND EVACUATION

SPEAKING at a conference of local authorities at Tunbridge Wells on July 19, Mr Walter Elliot said that he saw no reason to believe that evacuation would have to take place during the holiday season, but if it had special difficulties would arise in holiday resorts The Government's plan contemplated the dispersal of 3,000,000 people—mainly school-children with their teachers, younger children with their mothers, and expectant mothers—from the congested areas into relatively safer parts of the country in three or four days This operation was so gigantic and complex that one railway timetable—that of the Southern Railway for the evacuation of 475,000 persons from London alone—ran to 180 pages of close printing This timetable was only one of many To try to arrange for varying numbers of evacuees to be delivered to holiday centres according to the season of the year would, he said, introduce an unworkable complication People on holiday should not attempt to take their children back to an evacuable area if an emergency arose, but all who had essential work to do would be expected to return to their posts There would inevitably be overcrowding in holiday towns at the beginning of an emergency, and for a short time the ordinary standard of one person per habitable room would have to be exceeded The overcrowding would not last long because the evacuees would be redistributed

The Minister said that the transfer of handicapped children, expectant mothers and blind persons would be possible only where special arrangements for their reception had been made in advance, but difficulties were being surmounted For example, the London County Council had now been able to arrange for the reception in large houses and existing institutions of practically all handicapped children in their special schools Householders would not be expected to accommodate expectant mothers except on the understanding that the confinement would take place elsewhere

OVARIAN SYMPATHECTOMY

DESTRUCTION of the sympathetic nerve supply to the ovary, like many other operations on the sympathetic nervous system, has been practised on grounds rather of pious hope than of exact knowledge For example, R Démarez and L Devos (*Echo méd Nord*, 1939, 10, 233) base their advocacy of sympathectomy for certain ovarian lesions, particularly for sclerocystic ovaries, on the most meagre array of experimental evidence They admit that little or nothing is known of the influence of the sympathetic on the functions of ovulation and menstruation, and on the blood-supply and sensibility of the ovary, and that operations on the ovarian sympathetic supply are often unsuccessful Yet they then proceed to describe a large number of operations for the destruction of the ovarian sympathetic fibres either by section or by injection The reader cannot avoid feeling that a more critical attitude towards such procedures would save a number of patients from unnecessary operations

THE CHIROPODISTS' REGISTER

CHIROPODY is now a fully recognised and approved auxiliary medical service It has a status equal to that of the chartered masseur or masseuse, radiographer and biophysical assistant A degree of recognition was granted by the British Medical Association in July 1938 The details of control and supervision are delegated to the Board of Registration of Medical Auxiliaries This body is composed of representatives of the British Medical Association, the Society of Apothecaries of London the Chartered Society of Massage and Medical Gymnastics the Society of Radiographers, the Association of Dispensing Opticians and the Chiropody Group Council The council last named was formed by the board to act as the qualifying body to control and regulate the entry of chiropodists to the National Register of Medical Auxiliary Services, which is published by the board

In future, all chiropodists who satisfy the requirements of the board will be enrolled on this register A minimum course of training of two academic years has been laid down to allow for adequate clinical experience Chiropodists on the register have undertaken to confine themselves to their special subject, and not to treat anything below the level of the true skin, except under the direction and supervision of a medical practitioner Advertisement is forbidden to them, except "the insertion (subject to approval of the Chiropody Group Council) of announcements in appropriate approved newspapers concerning commencement of practice" The registrable qualifications in chiropody are member, fellow or associate of the Incorporated Society of Chiropodists (M I.S Ch , F I S Ch , and A I S Ch), and member fellow or associate of the British Association of Chiropodists (M.B.A Ch , F B.A Ch , and A B.A.Ch)

The register is supplied free to members of the medical profession, members of the public may obtain it on payment of 2*s* It is published by the Board of Registration of Medical Auxiliaries, B M.A House, Tavistock Square, London, W C 1

TREATMENT OF LAMBLIASIS

RESEARCH on the treatment of lamblia infection has been stimulated by a realisation that the disease is by no means confined to tropical regions A paper by M Maffi (*Arch Ital Sci Med colon* 1939, 20, 70) describes many methods of treatment which have been in vogue in some of these the aim has been direct intestinal antisepsis, as by bismuth or quinine, in others, use has been made of the indirect action of such drugs as neoarsphenamine or methylene-blue, through the liver and bile Maffi has developed a scheme whereby Atebrin is given by mouth in doses of 0 30 to 0 10 g (according to body weight) daily for some five days He has had uniformly good results in many cases, noting the disappearance of lamblia, both vegetative and cystic forms, from the faeces The treatment has caused no discomfort and he thinks that atebrin is now the remedy of choice in lambliasis

DOCTORS INTO MIDWIVES

THERE is, at the moment, a shortage of pupil-midwives, so we must welcome the scheme of the Midwives Department of the Coördinating Committee for Refugees for placing women refugee doctors in midwifery training schools They will train in these schools for two years, after which they will work for two further years as midwives in rural districts The intention is that they should eventually emigrate On starting their training they each need a good English textbook of midwifery, and doctors who no longer use their standard works would be doing a kindness by forwarding them to the chairman, Midwifery Department, Bloomsbury House W C 1 Doctors with spare books but no spare time to despatch them can drop a postcard to Bloomsbury House when arrangements will be made to collect them

GASTRO-ENTERITIS RESEARCH UNIT

A COMMITTEE was appointed in 1937 by the Medical Officer of Health for London to inquire into the ways of carrying out clinical and pathological research into the etiology, transmission and treatment of gastro-enteritis in children The committee suggested that a special unit should be established at a fever hospital for this purpose This suggestion was discussed at a conference with representatives of the Medical Research Council in January of this year and it was recommended that a research team should be formed at the North Eastern Hospital South Tottenham, consisting of a whole time non resident clinician, a whole-time assistant pathologist and two laboratory

technicians. One of the resident medical officers will also work with the clinician, and the pathological work will be under the general direction of the pathologist of the group laboratory at North-Western Hospital, Hampstead. As the question of ward infection enters into the problem of spread, the unit will collaborate with Prof. H. D. Wright, of Liverpool, Dr. W. H. Bradley, of Cambridge, and Dr. Joyce Wright, of London, who are already engaged in the study of ward infections with the support of the Medical Research Council. Adequate laboratory and other facilities are already available at the hospital.

ILLEGITIMACY AND THE LEAGUE

THE League of Nations has just published a short study on the legal position of the illegitimate child in the principal countries of the world.[1] In the last few years there has been a change in public opinion on the *illegitimate child, which is being regarded* more as the innocent victim of the irregular position of its parents. It is being granted rights similar to those of the legitimate child, or alternatively social measures are improving its position.

The study opens with a historical survey. This is followed by an analysis of the various laws on the civil status of the illegitimate child, its name, nationality, and legal domicile, measures to prevent disclosure of illegitimacy in official documents, re-establishment of the legitimate status, and inheritance rights. There is a chapter on the unmarried mother's rights, including her right to maintenance. The last part of the book deals with social insurance laws (which, in many countries, are definitely favourable to illegitimate children) and with special social welfare measures, including public assistance and preventive health measures.

MEDICAL RESEARCH COUNCIL

THE council invite applications for a fourth series of studentships and fellowships in clinical science and experimental pathology intended to encourage young British medical graduates of special ability and original mind to become investigators in branches of medical science which are concerned directly with disease as it occurs in human beings *Postgraduate studentships* are offered for medical graduates who have already held house-appointments and are strongly inclined to a career in clinical science or experimental pathology Each selected student will receive a stipend at the rate of £200 per annum, during a period not exceeding twelve months, for personal maintenance while undertaking approved courses of study in this country to advance his training in methods of research. This study may include modern languages and advanced physiological, pathological, and special clinical work under recognised teachers; but the approved course may not include studies of which the purpose is to enable the student to pass further examinations The council also offer *research fellowships* for candidates of similar qualifications who have already had some experience in the use of research methods Each fellowship will be tenable for one year at the ordinary value of £250 per annum, and will be renewable in approved instances at the rate of £300 per annum for a second year These fellowships are intended as probationary *appointments for research* in clinical science or experimental pathology under suitable direction in this country. Research expenses may be provided in addition to stipend. Applications should be lodged with the secretary of the council, 38, Old Queen Street, London, S W 1, before Oct 1

INDEX TO "THE LANCET," VOL I, 1939

THE Index and Title-page to Vol. I, 1939, which was completed with the issue of June 24, will be ready shortly A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C 2 Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now

1 Study on the Legal Position of the Illegitimate Child Document Ser. L o N P 1939 Pp 194 4s

Births, Marriages and Deaths

BIRTHS

FINEGAN —On July 22, the wife of Dr G A Finegan, of Southgate, N 14—a daughter

ROBERTSON —On July 18, at Little Waltham, Essex, the wife of Dr H D Robertson—a daughter

ROFFEY —On July 15, at Sevenoaks, the wife of Dr Alec Roffey—a son

THOMAS —On July 14, the wife of Mr J M Ridley Thomas, F.R.C.S.E., of Norwich—a son

WIGGINTON —On July 16, at Eltham, the wife of Dr D J Wigginton—a daughter

MARRIAGES

O'DONOVAN—GILL —On July 22, at St Columba's Catholic Church, Selsdon, Denis Henry O'Donovan, M B , of Dublin, to Phyllis Marjorie Gill

ROBIN—CROFT —On July 19, at St Mary's, Lambeth, Ian Gibson Robin, F R C S , to Sheilagh Marian Croft

SMITH—BELL —On July 19, at St Mary's Church, South Kensington, H S Cunningham Smith, M R C S , to Rosemary Bell

DEATHS

COOK —On July 22, Herbert George Graham Cook, C B E , M D Lond , F R C S , of Cardiff

COOKE —On July 20, William Edmund Cooke, M D Lpool, F R C P , of Wigan

MARETT —On July 22, Philip Janvrin Marett, M R C S , lieut.-colonel R A M C (retd)

MARRIOTT —On July 21, at Leicester, Cecil Edward Marriott, M Chir Camb , F R C S

POTTS —On July 23, at Birmingham, William Alexander Potts, M.A Camb , M D Edin , M D. Birm

ROBERTSON —On July 18, at Storrington, John Robertson, M A. Edin , M D Lond , aged 76

TAYLOR —On July 17, at Edinburgh, James Anderson Taylor, M A St And , M D Edin , late of Dunkeld

VALLANCE —On July 21, at Lewes, Herbert Vallance, M R C S , aged 73

YOUNG —On July 23, at Glasgow, Archibald Young, T D , B Sc , M B Glasg , F R F P S G , regius professor of surgery in the University of Glasgow

N B —A fee of 7s 6d is charged for the announcement of Births, Marriages, and Deaths

STERNAL PUNCTURE —Prof. John Plesch (London, W.1) writes " In his article in your issue of June 17 on this subject Dr. Martin Hynes gives a brief survey of the history of bone-puncture May I point out that in 1906 there appeared an article in No 18 of the *Deutsche medizinische Wochenschrift*, under the title 'Probebohrung als Diagnostisches Hilfsmittel,' describing the method and its purposes ? "

The fourth annual general meeting of the Ethical Pharmaceuticals Association was held in London on July 14, with Mr. A W Edwards, the chairman, presiding, who, in the course of his report, announced that three more firms had joined the association during the past year He urged the importance of increasing the membership of the association still further if it was to play its part both in registering opposition to retrograde and unfair proposals and undertaking constructive measures on its own initiative in the interests of medicine and pharmacy in general and its own members in particular.

" . The Universities have unconsciously done an ill-turn to the service of biology as a national asset by favouring research at the expense of school teaching, the best men are usually guided into the paths of scientific investigation, and second raters are often looked upon as good enough for the services of scientific education and the investigations it so badly needs Yet if there is any situation that requires re-examination in the nations today, it is the chasm between scientific progress and the knowledge and spirit to use that progress solely for the benefit of mankind No certain method of bridging this gap is evident. But any reasonable suggestion is worthy of trial, and if, as has been suggested, the national teaching of biology is likely to create a scientific attitude of mind such that appreciation of the social and moral implications of science becomes second nature, then the best men and women are not too good for a task upon which may depend the ultimate progress of humanity."—*Nature, Lond* July 22, 1939, p. 130

ADDRESSES AND ORIGINAL ARTICLES

VISCERAL NEUROSES

By JOHN A RYLE, M D Lond, F R C P

REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE, CONSULTING PHYSICIAN TO GUY'S HOSPITAL LONDON

I*

An invitation to lecture before this College compels a considered selection of subject, title, and material which may in itself be held worthy of brief analysis In my choice of subject I have been influenced partly by developing personal interest and by the nature and quantity of the material within my reach, and partly by a desire to examine accumulated observations in such a way as to clarify my own thought and, where possible, to assist the thought and practice of others I have always preferred the appeal of familiar phenomena to the excitation of the strange or rare, and rightly or wrongly, but as time and the opportunity of a physician's life dictated, have set my training in recognition, description, and classification before the call to intimate or particular research In my clinical philosophy the general human problem and the special pathological problem, alike only in their complexity, have claimed, if not the same attention at least an equal regard The title of these lectures is borrowed from a distinguished predecessor at Cambridge, one of our own most scholarly Fellows, the late Sir Clifford Allbutt In 1884 Clifford Allbutt gave his Goulstonian lectures on the Visceral Neuroses Many besides myself must have enjoyed and often re read the slender booklet in which they were later published The fifty five years which have since passed have witnessed great advances in the methods open to us for the objective study of the normal and morbid physiology of the viscera, and, although many of Allbutt's observations are as sound and instructive today as when they were first written, others would require revision in the light of our newer and more precise knowledge Although his understanding of men, women, and temperaments may still serve to correct our over-mechanistic interpretation of certain visceral disturbances, modern chemistry, radiology, and endoscopic technique, had they been then available, would certainly have traced some of his 'neuroses" to an organic defect

But we have advanced not only in the realm of objective physical inquiry, for psychology too has begun to assist the elucidation of bodily disords in a more methodical way Moreover, those peculiar humoral disturbances now commonly called allergic are today regarded as capable of influencing other structures besides the bronchioles and the skin In the scientific field the fundamental contributions of two great physiologists, Pavlov and Cannon, have thrown light in dark places and given us explanations and experimental proof of numerous phenomena which clinical study alone could never have unravelled

It seemed to me therefore, that the time was ripe for a reconsideration of Allbutt s problem If I do no more than point the way to a clearer classification and understanding and a better diagnostic of the functional misdemeanours of certain organs my observations may yet serve a useful purpose and suggest fresh lines for future study

My information has been mainly culled from the files of my private cases Intimate personal histories, adequate family histories, careful symptom-analysis, and a systematic exclusion of organic possibilities are a necessary preliminary to the diagnosis of the visceral disorders These evidences are better obtained in the atmosphere of the consulting room or the sick room than in a ward or outpatient department It is probable too that the visceral neuroses are of more frequent incidence in those classes which do not earn their livelihood or control their homes by manual labour Furthermore, the disability accompanying a visceral neurosis, although often prolonged and considerable, is not as a rule so severe as to call for admission to hospital Writing of the colonic neuroses Hawkins (1936) said "Intestinal neuroses diminish in frequency as we descend the social scale" The same can be said of the other visceral neuroses, although allowance must always be made for the greater frequency with which the prosperous classes seek medical advice and for their better aptitude for describing symptoms

NATURE AND DEFINITION OF VISCERAL NEUROSIS

The visceral neuroses may be held to embrace those disorders of visceral movement, secretion, or sensation which occur in the absence of organic disease I shall not include in my category mere *anxiety about an organ* in the absence of good evidence of such disorder It is not rare for patients to present themselves in a state of anxiety about an organ on account of symptoms having no connexion with it, or because a suspicion of disease affecting it has been created by the remarks of friends or an unwise medical opinion Although, therefore, anxiety may and often does cause or contribute to a visceral neurosis, and although a visceral neurosis may in turn maintain anxiety, the concept of such a neurosis should include some real disturbance of visceral function To make our meaning more precise we must also exclude the operation of remote as well as local organic disease, for disease in one viscus may propagate nervous impulses which disturb the function of another viscus, and blood states or structural disease of the central nervous system may be expressed by disorders of function in one or more of several intact organs Of such disorders the dyspepsia (as distinct from the primary gall bladder pain) which accompanies cholecystitis, the cardiac dysfunction of anæmia, and the vomiting of tabetic crises are familiar examples.

All the functional disorders of the hollow organs which we have in mind can, broadly speaking, be regarded as due to an interference with the nervous regulation which derives from the sympathetic and parasympathetic systems and controls the rhythm, quality, and quantity of the contractions in plain muscle and the secretions, blood supply, and sensations of these organs We must further refine our concepts when we come to consider dysfunction due to chemical stimulation Such stimulation must be accompanied by local metabolic change although not by organic disease in the sense of persisting tissue modifications, the avoidance of which is probably due to the counteraction or reversibility of a chemical change Chemical stimulation may be exogenous, as in the case of foods poisons, and drugs, or endogenous, as in the case of the secretions of the pituitary or the suprarenal glands We also accept, on the basis of the researches of Loewi and Dale and their co workers, that the nervous impulse

* The first Croonian lecture delivered at the Royal College of Physicians on May 18 1939

itself, however initiated, is associated with a chemical discharge

Now, it is a remarkable but frequently confirmed observation that certain clinical phenomena, such as angioneurotic œdema and bronchial spasm, can be precipitated, on the one hand, by emotional causes, which presumably operate through the nerves, and, on the other, by an inhaled, ingested, or injected foreign protein, which presumably operates through the tissue fluids. So specific in type are these clinical or biological responses, that it is difficult to believe that the determining stimuli in the two instances are widely dissimilar. In other words, whether we regard certain disturbances (among which we may come to include some of the hollow-organ neuroses) as due to emotion or to allergy or sometimes to one and sometimes to the other, we can simplify our ideas by supposing in each case the immediate influence of a similar or identical chemical stimulus. A nervous subject is sometimes but not necessarily shown to be sensitive in the allergic sense. An allergic subject is frequently, perhaps, but not always shown to be sensitive in both senses. His sensitiveness may be increased or conditioned in many new ways with the passage of time. The immediate or determining stimulus, however, for his particular clinical or biological response may for the present be presumed to be specific and chemical.

Finally, in so far as pharmacological counteraction of the visceral or vascular phenomena of emotion or of allergy is possible, we find that certain well-defined substances, such as atropine, eserine, and ephedrine, are the most effective. There are observations available, as Gaddum (1938) and Fraser (1938) have lately reminded us, which suggest that the influence of these substances is intimately related with the interactions of certain endogenous substances now held to be the chemical determinants of the local muscular reaction to a nervous impulse. These substances include adrenaline with its counteragent amine oxidase and acetylcholine with its counteragent cholinesterase.

Briefly we are coming nearer to an understanding of clinical symptoms (or biological responses) variously and loosely attributed in the past to nervousness, idiosyncrasy, and allergy. Whether we include these responses under the generic title of "neuroses" or invent a better name for them, we are finding experimental and clinical justification for considering them together and not separately and for regarding them, however originated, as dependent on specific physiological disturbance rather than hypothetical nervous influence or structural change With very rare exceptions the responses themselves, however frequently and for however long a period they may be repeated, remain uncomplicated by secondary structural change, for the most careful examination of the organs and tissues concerned reveals no lasting abnormality. In each episode, in fact, the eventual counteraction of an excessive chemical stimulation is complete and perfect

Analogies have been drawn between the visceral neuroses and stammering Sir James Paget (1879) in a classical paper on "Stammering with other organs than those of speech," in which he discusses the neuroses of the bladder in particular, wrote: "Stammering, in whatever organs, appears due to a want of concord between certain muscles that must contract for the expulsion of something, and others that must at the same time relax to permit the thing to be expelled" The result, as with the speech stammerer, is inhibition or disorderly action with distress or, in the case of some viscera, actual pain

The victims of visceral stammering are of kindred temperament with the speech stammerers. Visceral and speech stammering not infrequently occur in the same person. Again and again we can trace the symptoms of the visceral neuroses to a failure of relaxation or to a too precipitate contraction of plain muscle, or to a loss of the normal tonic or peristaltic habit Kennedy and Williams (1938) have also drawn attention to the association of stammering and the allergic disorders. From this we must rather conclude that there is an association between nervousness and allergy than that stammering is an expression of allergy. The terms "vagotonia" and "sympathicotonia," associated with the names of Eppinger and Hess (1917), sought to explain liability to many of the visceral disturbances, but I am not satisfied that a simple separation into these reactive types is clinically justifiable.

FUNCTIONAL AND ORGANIC

In considering, as we shall later do, the individual nature and symptomatology of the visceral neuroses it should be emphasised that, although generally distinguishable by careful clinical analysis, they can and do imitate organic disease sufficiently closely to lead again and again to erroneous diagnoses The recognition of a visceral neurosis depends largely on the recognition of its subjective phenomena, and we would here do well to remind ourselves that all subjective symptoms, whether due to structural disease or other physical cause or to nervous or chemical unrest, express only a disturbance of function, and that a similar disturbance of function may result from any one of these causes. A symptom, in other words, is specific for a disturbance of function and not for its cause. A carcinoma or a nervous spasm may each cause colonic pain; in both instances the pain accompanies abnormal tension, perhaps with attendant ischæmia, in the muscle-fibre. Cardiac pain may be due to emotional stimuli, to anæmia, or to sclerosis of the coronary arteries; in each of these instances we believe the pain to be related to chemical disturbance arising from anoxia in the cardiac muscle-fibre.

To call an organic disease functional is an old and regrettable error. It may be as grave an injustice to a patient to call a functional disease organic. It is melancholy to contemplate the countless abdominal operations which have been performed and the countless physical treatments which have been prescribed in the past for disorders affecting the stomach, the bowel, the heart, the uterus, and other organs, which are no more "organic" than bronchial asthma, extra-systoles, blushing, or blepharospasm.

Differential diagnosis must be decided partly, it is true, by the quality and degree of a subjective symptom, but partly also by associated phenomena, and by temperamental assessments and routine objective tests Without a physiological interpretation of symptoms, however, all diagnosis remains incomplete

HISTORY AND LITERATURE

To attempt to combine a condensation of personal experience with an adequate digest of the scattered literature of so wide a subject as the visceral neuroses would be a difficult task. In a large but compact volume running into 430 pages and with a bibliography of 150 pages Dunbar (1935) has lately reviewed and abstracted the literature relating to the psychosomatic disorders covering the period 1910–30. Of this literature a considerable proportion is concerned with the emotional disturbances of the viscera, but it must be allowed that the advancement of knowledge

in a clinical regard within that period and since has been neither very methodical nor very extensive Cannon and Pavlov have given us basic knowledge and a host of fruitful ideas, but these have not influenced contemporary medical thought as they should have done

In recent years important observations on the influence of the emotions on the organs have been made by Wittkower (1935) and his collaborators, who have employed psychological experiment in conjunction with physiological and radiological studies and the psychiatric approach More attention, however, is paid at present to the psychology and psychiatry of these disorders than to their morbid physiology, their symptomatology, and their differential diagnosis from organic states Careful description and differentiation should surely anticipate or at least accompany therapeutic innovation Where psychiatry will be as liable to failure as the therapeutics of the physical school is in its omission to study the type or mode of the physiological disturbances consequent upon emotion Furthermore it has not been sufficiently emphasised that numerous factors other than emotion may contribute to the establishment and perpetuation of a visceral neurosis

Perusal of the literature and contact with the practice of the last quarter of a century reveal stages of thought and changes of fashion in which sometimes the organ, sometimes the nervous system, sometimes a mechanistic, sometimes an infective, emotional, or chemical hypothesis has focused attention for the time being Terms such as "vagotonia" or "organ inferiority" have replaced local pathological concepts such as "colitis," and in the field of treatment surgical trial and error and other physical measures are making way for psychiatric experiment With patient winnowing wheat may, it is true, be found among the chaff of much vague and unsatisfactory pathology From close clinical study, however, and from such study alone, emerges the prime necessity of observing and investigating the "whole man" if we are to reveal the pathogenesis and paint the true picture of a visceral neurosis and effectively to assess, for purposes of understanding and management, the contributions of heredity, temperament, physique, environment, emotion endocrine dysfunction, allergy, and the conditioned reflex Together with such study, and not separately from it, we should seek, whenever possible, to employ such special methods as physiology and psychology can prove to be effective

CRITERIA OF ALLERGIC PHENOMENA

In describing some of the visceral neuroses I shall have occasion as already indicated, to consider the possible contribution of natural sensitivity or allergy The list of manifestations attributed to allergy has already been unduly expanded Many of the newer additions have been made with little justification The term itself is providing a new cloak for ignorance I suggest that no visceral, cutaneous, or vascular symptoms should be held to be allergic unless some, and preferably several, of the following postulates are fulfilled

(1) The symptoms should bear close comparison with symptoms observed in human anaphylaxis or serum-sickness

(2) There should be a history of "idiosyncrasy" in respect of some food, beverage, tobacco drug or other extraneous substance or a well defined response to specific cutaneous tests

(3) There should be observed in conjunction with the suspect phenomenon, whether coincidentally or at other times, other accepted allergic phenomena, such as asthma, hay fever, urticaria, and angioneurotic œdema

(4) There should be a family history of these disorders

(5) The disturbances should show some such intermittency or periodicity as obtains in these disorders

(6) Every care should have been taken to exclude the presence of irreversible structural disease

(7) As additional tests Hurst (1933) mentions a favourable response to adrenaline and the presence of eosinophilia

The only final proof of allergic sensitiveness is a specific response to a specific allergen, but we must recall that this is by no means universally obtained even in such conditions as bronchial asthma and urticaria, hence its absence in other conditions need not be held to exclude them The clinical observations reported hereafter suggest that we have latterly, in our clinical assessments, attached too much importance to the idea of specific sensitivity, and that the so called allergic response is only one of many expressions of a hypersensitiveness to adverse stimuli (whether physical, chemical, or psychological) which attaches to certain types of human constitution It is a common observation that the same individual may manifest the same intestinal intolerance to a food-stuff, an east wind, fatigue, or a mental problem Angioneurotic œdema, although it may be induced by a bee sting or the injection of a serum, is often evoked by emotion The general and nervous health or balance of the individual at the time of exposure to an adverse stimulus may also determine the appearance or non appearance of the specific response, much as other forms of reflex activity may be heightened or diminished by an attendant but unrelated circumstance Nervous unrest and allergy are often partners, both may be capable of evoking the same symptoms in the same patient, but it remains for us to discover the nature of the relationship and the reason for the similarity of their effects The primary evidence for these statements is to be found in the daily experience of the clinic, the final explanation of the observed phenomena will only be attained by experimental methods

SCHEME OF INQUIRY

I propose to confine myself to a consideration of functional disorders affecting certain of the hollow organs Of the solid organs the liver particularly may also have its nervous disturbances, but these have not yet acquired clear definition, the nature of the disturbances is uncertain they are rarely painful affections or locally manifest, and they seldom lead to serious misinterpretations Nor shall I consider the respiratory neuroses Asthma is too large a subject Other disturbances of respiratory rate or rhythm under the influence of the emotions are scarcely visceral in the true sense Of the hollow organs I shall review in turn the gullet, the colon, the rectum, the urinary bladder, and the heart The uterus for lack of special knowledge, although its spasmodic neuroses are well known, I have left out of account Omission of the stomach may seem a peculiar decision, but I have to confess that, although much of my time and thought have been devoted to gastric physiology and pathology, and although gastric neuroses are common enough the difficulties of separating them from organic states, from associations of organic change with functional super additions (including the effects of atrophigy), or from reflex disorders of gastric function due to organic disease in neighbouring structures remain so considerable that I have preferred to concentrate on other viscera Alvarez (1940) in America, with his sensible physiological approach, has made valuable contributions to

the clinical study of the gastric neuroses, but they await a more intimate investigation. The organs chosen for consideration in these lectures are less liable than the stomach to inconspicuous inflammations and ulcerations and to reflex disturbances and can be more certainly passed as free from organic defect by modern methods of investigation. We shall, perhaps, be in a better position to segregate the gastric neuroses when gastroscopy has added to radiology and chemical analysis a more direct and reliable knowledge of the living mucosa. In the meantime the principles which should govern their clinical study differ in no essential from those to be described in the case of other organs.

The descriptions and discussion which follow are based upon a perusal of the records of 33 cases of œsophageal neurosis, 321 of colonic neurosis, 15 of rectal neurosis, 2 of serious bladder neurosis (the minor neuroses of the bladder being too numerous for analysis and not separately indexed in my files), and 63 of cardiac neurosis Many of the descriptions will be familiar; others may seem to have gained something through added detail and a closer symptom-analysis than is usually accorded them Among the visceral neuroses some are of indefinite type and some of more constant pattern. It is with the second group that my descriptions will be chiefly concerned The more constant the clinical pattern the more likely is it that we are confronted with a specific physiological error To attempt an analysis of the indefinite types of visceral neurosis would scarcely as yet prove a fruitful labour. In classifying results I debated at first whether it would be better to take each organ separately and to consider its important neuroses or under the several ætiological headings to consider examples of various visceral manifestations. The more I considered my case-histories the more pronounced became their ætiological complexity, even though competence for the recognition and sifting of likely causal factors in the individual may be allowed to have increased with experience It was also clear that different stimuli repeatedly caused or appeared to cause the same response. For these reasons and because anatomical classifications in medicine still have their uses the first plan appeared the only reasonable one to adopt. Brief mention will be made, in passing, of organic states which may be confused with the neuroses and particularly certain states which have recently been given distinctive portraiture by improved methods of objective study. Multiple neuroses often coexist in the same patient and are among the best evidences of a general or emotional cause To these associated neuroses frequent reference will be made

ÆTIOLOGY

Certain general ætiological considerations must claim our attention before the particular neuroses are passed in review When a patient presents himself with a complaining organ, when no evidence of structural change in that organ is forthcoming, and when symptom-analysis and the circumstances of his life and temperament suggest that he may properly be regarded as a victim of a visceral neurosis, diagnosis in the full sense still remains incomplete until we can suspect an exciting stimulus and have obtained demonstration or at least framed a reasonable physiological explanation of the mechanism of the neurosis Clinical, radiological, and other objective investigations have done much to explain the morbid physiology of the hollow organs and can discover or exclude organic states with increasing certainty. Intimate clinical histories and hypothesis based upon them and strengthened by the work of Cannon and by Pavlov's classical experiments on the conditioned reflex can at least carry us a stage further in the study of ætiology and may at present be held to justify the following conclusions in regard to the origins and perpetuating causes of the visceral neuroses.

(1) The origin of a visceral neurosis may be found in a previous but finally departed organic injury. Thus a past dysentery may leave in its wake a spastic or irritable colon, or a cystitis be followed by a nervous frequency In similar fashion a bronchitis is sometimes succeeded by asthma, or a conjunctivitis by habitual blinking "Conditioned irritability" would, perhaps, be an apt definition of such a neurosis. In each example quoted the local inflammatory irritation has passed, but the habit of irritability remains. In each example a central or peripheral irritation, sometimes minimal and often far to seek, is required to determine the active dysfunction.

(2) The origins of a visceral neurosis may be found in an inborn, or more rarely an induced, sensitiveness or allergy In such case the "irritability" is conditioned by a "humoral" instability, while the active dysfunction is determined by specific stimuli. As with asthma, however, the passage of time may result in a more ready determination of attacks by both old and new stimuli The sensitiveness becomes less specific The active irritation, as distinct from the irritability, is determined in new ways As will be shown, colonic and rectal neuroses, which are sometimes associated in the same individual with asthma, urticaria, hay-fever, or migraine, can rarely be traced to a single specific cause.

(3) The origins of a visceral neurosis may be found in a psychological instability unassociated with the conditioning factors named above but manifest as anxiety or other emotional unrest. Prominent among the perpetuating factors is the patient's fear that the visceral symptoms may be due to organic disease

(4) As with bronchial asthma, so with the disorders of the abdominal viscera any or all of the provocative factors named may operate simultaneously or at one time or another in the same individual and may serve as reinforcing stimuli. A humoral state may provide the condition for an emotional reaction, or an emotional state for a humoral reaction An asthmatic tendency based on a native allergy, and the asthmatic attack itself due primarily to pollen or some other specific factor, may, as the years pass, undergo aggravation or be occasioned by a variety of other factors, physical or psychological, and including dust, fatigue, locality associations, or emotional repressions A similar evolution may eventually be found to be true for the neuroses affecting the abdominal viscera.

(5) Whatever conditioning or determining causes we invoke, we have good reason to suppose from studies of temperament, physique, and family history that hereditary predisposition is a main foundation upon which the visceral neuroses are based Both conditioning and determining extraneous stimuli—e.g., a past inflammation or present irritation—operate frequently but with little or no effect in persons lacking the nervous or humoral predisposition or diathesis In most cases of visceral neurosis there is a history of nervousness on one or both sides of the family The inherited tendency or diathesis is best regarded as a biological variation Variations may be observed in degree as well as kind Correlated variations, here as elsewhere in nature, are common

(6) Finally (although such cases cannot strictly come within our category) an organic state incapable

of producing symptoms under favourable conditions may, in the presence of anxiety, lead to visceral disorder Thus, I have seen achalasia of the cardia with pronounced œsophagectasia causing small inconvenience in quiet times or even under the crudest dietetic conditions in times of holiday, but under the worrying conditions of professional life, domestic infelicity, or international crisis occasioning a return of the usual troublesome dysphagia and regurgitation Anxiety may also perpetuate angina pectoris, which will again disappear with relief of mind, even though we have good reason to suppose that the primary basis of the pain was organic coronary artery disease

I have thought it well to formulate these views relating to etiology in advance of the evidence on which they are based This evidence has been sought and must be sought again in clinical experience which constantly checks and modifies its own conclusions, in the frequent re-reading of case notes, and, where possible, by "follow up" inquiry I believe and shall hereafter support the belief that the classification of causes outlined above, although it may stand in need of fuller proofs, is a useful one, if only as an aid to the management of cases and as a reminder that the visceral neuroses are not all or wholly emotional in origin, not all or wholly implanted in allergic soil, and not all or wholly a consequence of physical factors in the shape of present or past organic irritation

The whole man and his environment will remain an essential part of the study of the visceral neuroses, whatever refinements of knowledge may accrue from physiological, biochemical, or psychological inquiry

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"The world of today is suffering from a crisis of disillusion and resentment against reason, simply because it believed too much in it before Human life can only stand one homeopathic dose of reason at a time In love with logical perfection, and also afflicted by the injustices and inequalities of everyday life, the men of the nineteenth century tried to force the pace of human progress by establishing the perfect society ruled by rationalist justice This noble effort was the dream of the French Revolution Under the Revolution itself human life turned with unheard of violence against the domination of rationalised logic, and the world saw this strange paradox the triumph of the most unbridled irrationalism in the name of the most rigid reason This affliction has gone on in various forms during the whole of the nineteenth century, and it is even today the keynote of many happenings, both large and small which we see around us But England never took part wholeheartedly in this rationalistic mania of our epoch However much she might be in love with ideas she always retained a certain reserve for the unexpected the errors of men, and the ways of unfathomable nature As an external and positive symbol of this attitude, England never gave the first place in her public life to the intellectual or the thinker But, actually because of that, the intellectual and the thinker still occupy the high place in England that they have always had, while one sees them dethroned and persecuted in countries that have suffered from an excess of intellectualism and where political advance was wont to be preceded by philosophical standard bearers"—SALVADOR DE MADARIAGA The Island of Commonsense,' in *The Listener*, July 20 1939, p 110

ENCEPHALOMYELITIS FOLLOWING ADMINISTRATION OF SULPHANILAMIDE

BY J H FISHER, M B Sydney, M R C P.

A MEDICAL CHIEF ASSISTANT AT THE ROYAL INFIRMARY, MANCHESTER LATE MEDICAL REGISTRAR AT THE SOUTHEND ON SEA GENERAL HOSPITAL

With a Note on Histological Findings

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NUMEROUS toxic manifestations are known to have followed the use of sulphanilamide Many of these are not serious, for example cyanosis, dermatitis, febrile reactions, nausea, vomiting, and enteritis Others, which are uncommon but more important, are anæmias, agranulocytosis, and hepatitis Their cause seems to be an idiosyncrasy to the drug, for they develop very rarely, and often after only small amounts of the drug have been taken Toxic effects on the central nervous system have seldom been recorded In the two following cases symptoms of encephalomyelitis appeared after administration of small quantities of sulphanilamide

The First Case

A woman of 33 was admitted to the Southend on Sea General Hospital on Sept 7, 1937

History.—Four years previously she had begun to suffer from arthritis of the fingers, ankles and knees, and for this she was treated with gold injections Six months later she developed lupus erythematosus

Examination.—The lupus erythematosus affected chiefly the nose, face, ears and back of the hands The rheumatoid arthritis involved the fingers, wrists, knees and ankles, and she complained of pain in the affected joints There was moderate anæmia, the blood-count being:—

Red cells	4 096 000	Polymorphs	70%
White cells	5700	Lymphocytes	26%
Hæmoglobin	65%	Large mononuclears	4%
Colour-index	0 8		

Progress.—The temperature rose occasionally to 99° or 100° F On Sept 28 treatment with sulphanilamide was started, and she was given 0 5 gramme twice daily Even on this small dose she became cyanosed on the second day, but as she was in no way distressed, administration of the drug was continued On Oct 11 the temperature rose to 101 5° and she had a slight headache Next day the temperature was 104° and the headache more severe The drug was stopped Two days later (Oct 14) she suddenly developed complete flaccid paralysis of both legs, her neck was a little stiff, the knee- and ankle-jerks and the abdominal reflexes were absent, and the plantar reflexes were not elicited Sensation for light touch was lost up to the level of the iliac crests, and sense of position in the feet was also lost; but pain and vibration sense remained

The cerebrospinal fluid (C S F) removed on Oct 14 was turbid and under increased pressure Cells 16 000—almost all polymorphs, with a few red blood-cells Protein 100 mg per 100 c cm Chloride 660 mg Globulin, marked excess No tubercle bacilli seen, and culture sterile Leucocytes 4700 (polymorphs 70 per cent, lymphocytes 27 per cent, large mononuclears 2 per cent, eosinophils 1 per cent)

On Oct 15 sensation was completely lost up to the level of the fifth thoracic segment, and retention of urine developed On the 17th the anæsthesia had ascended to the second thoracic segment and there was consolidation at the bases of both lungs She died on the 18th.

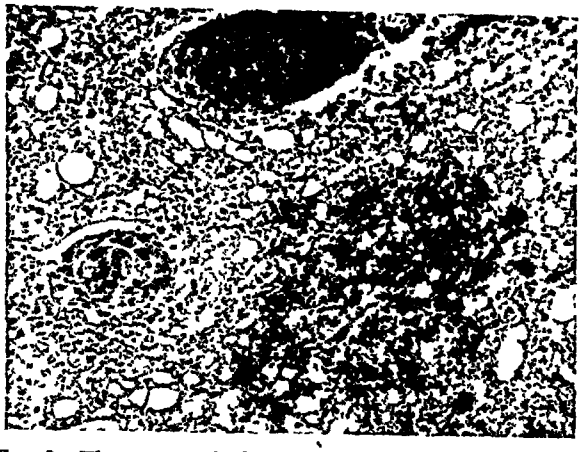

FIG. 1—*Thoracic cord. Hæmatoxylin and eosin.* Thrombosis of two small vessels and a hæmorrhage in white matter. (× 115.)

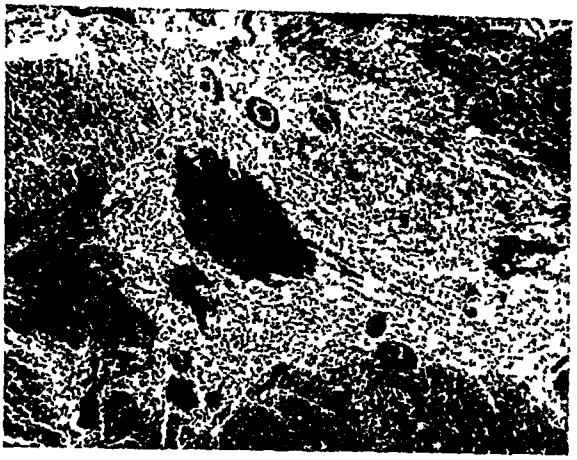

FIG. 2—Thoracic cord Loyez Hæmorrhages in substance and in sheaths of vessels in grey matter. (× 30)

Post-mortem examination.—There was hypostatic pneumonia of both lungs, with caseating hilar glands. The liver showed chronic venous congestion, with caseating glands at the hilum. The lumbar region of the spinal cord was softened and diffluent. The thoracic cord showed injected vessels and minute streaked hæmorrhages.

HISTOLOGY OF BRAIN AND CORD

(DR. GILMOUR)

Sections were made from the following tissues received in 4 per cent. formaldehyde. cerebral cortex, 3 portions; cerebellum, 1 portion; medulla, 2 portions; spinal cord, 4 portions (1 upper cervical, 2 thoracic, and 1 lumbar). Paraffin sections prepared from all the tissues were stained with Ehrlich's hæmatoxylin and eosin, Weigert's iron hæmatoxylin and van Gieson, Hart's modification of Weigert's elastic method, and Loyez's method for myelin. Frozen sections were stained by Herxheimer's method. Weigert-Pal preparations were made from one of the thoracic portions of the cord.

The *medulla*, two portions of the *cerebral cortex*, and the *basal ganglia* were normal histologically. There was a very slight desquamation of leptomeningeal cells forming round free cells with abundant cytoplasm in places on the surface of the cerebellum, and in the depth of a sulcus in the third portion of the cerebral cortex. These are of doubtful significance.

In the *upper cervical cord* a few lymphocytes and round leptomeningeal cells were present about a few veins in the leptomeninges.

In one portion of the *thoracic cord* three small veins in the leptomeninges showed recent thrombosis Some round leptomeningeal cells were present about vessels in the anterior fissure, and associated with some lymphocytes also in the adventitia of vessels in the posterior median septum. Three small vessels in the white matter were thrombosed (fig. 1 illustrates two of these) Fibrin was precipitated in a few, and hæmorrhage was present (fig. 2) in many Virchow-Robin spaces. All vessels in the cord were congested One showed necrosis of its wall (fig. 1). Many scattered minute hæmorrhages were to be seen in both grey and white matter (figs 1 and 2). The peripheral white matter in many places showed great ballooning of myelin sheaths by a clear fluid-like substance (fig. 3) The grey matter was slightly shrunken and œdematous, and the bodies of the neurones were usually very degenerate, and many had disappeared. Slight proliferation of rounded microglia cells was seen in the grey matter, and about some vessels in the deeper parts of the white matter. There had been some loss of myelin in the ballooned areas, in the grey matter, and about the vessels in the deeper white matter (figs. 4 and 5).

The other portion of the thoracic cord and its meninges were congested. Fibrin was present in a few, and hæmorrhage in other Virchow-Robin spaces in the cord. Œdema, and degeneration and loss of many bodies of neurones were evident in the slightly shrunken grey matter. There was much ballooning of the peripheral white matter. In the grey matter, and around vessels in the deeper white matter, many rounded microglia cells were noted. The subarachnoid space was filled with crushed and softened cord substance which had come from the lumbar region during the process of removal of the cord. In frozen sections one or two fat granule cells were present in the adventitia of a few vessels in the cord.

The *lumbar cord* was collapsed from loss of much of its substance, and the pia was wrinkled. A small artery in the pia showed fibrinoid necrosis, thrombosis, and slight leucocytic infiltration and fibrin deposition in the adventitia A few veins in the leptomeninges showed recent thrombosis. There was frequently slight lymphocytic and leucocytic infiltration or hæmorrhage in the adventitia of the congested vessels within the cord. Some vessels showed necrosis and slight leucocytic infiltration of their walls. The cord substance was greatly reduced in amount, fragmented and structureless. There was hæmorrhage in a spinal nerve-root. Much fragmented structureless cord tissue was present in the subarachnoid spaces, derived from the cord by trauma during its removal.

The pathological changes consisted of softening of the cord substance, and various vascular lesions. The latter consisted of congestion, hæmorrhages, and thrombosis in small arteries and veins, and fibrinoid necrosis of the walls of small vessels The softening was shown by ballooning of the myelin sheaths in the superficial white matter, proliferation of rounded microglia cells and demyelination around some vessels in the deeper white matter and in the œdematous slightly shrunken grey matter, and by the loss of many bodies of the neurones. This was seen in the thoracic region, but softening had been so marked in the lumbar region that the tissue was semifluid, and readily escaped into the subarachnoid space during removal of the cord.

The Second Case

A woman of 28 was admitted to the hospital on Nov. 4, 1937, complaining of painful red swellings on the legs.

History.—For ten days she had had sore-throat, generalised aches and pains, sweating and fever.

There was no swelling of joints On the day before admission she developed raised red tender spots on the front of both her legs Her past illnesses included rheumatic fever and frequent attacks of tonsillitis

Examination —Temperature 102° F Acute follicular tonsillitis, and moderate bilateral cervical adenitis Numerous scattered lesions of erythema nodosum on the front of both legs Heart and chest normal Cranial nerves normal, knee jerks, ankle-jerks, and abdominal reflexes present, plantars flexor

Course of illness —After five days' treatment with salicylates the temperature became lower and the lesions less conspicuous On Nov 9 treatment was commenced with sulphanilamide, 1 0 gramme thrice daily, and slight cyanosis developed after twenty four hours On the 14th, after six days' administration of the drug, her temperature rose to 103°, and there was a fresh extension of the lesions of erythema nodosum She complained of severe headache and vomiting, and there was severe shooting pain in the right leg, which showed slight muscular weakness The cranial nerves were normal, the knee-jerks and ankle-jerks were much exaggerated, there was bilateral ankle-clonus present, the abdominal reflexes were absent, and the plantar responses were flexor Lumbar puncture on the 14th produced a clear cerebrospinal fluid, normal on examination, and not under pressure

Sulphanilamide was stopped The temperature returned to normal after four days, and the headache and pain in the leg disappeared after a few weeks On discharge there was still some weakness of the right leg The abdominal reflexes were absent, the knee-jerks and ankle-jerks were markedly exaggerated, and there was still ankle-clonus on the right side

Discussion

In these two cases lesions of the central nervous system developed during treatment with sulphanilamide In case 1 the symptoms suggested an acute ascending myelitis, in case 2 the clinical findings were consistent with encephalomyelitis The out standing post mortem features of case 1 were the perivascular demyelination in the thoracic cord, the vascular damage, and the massive softening of the lumbar cord

(1) The *perivascular demyelination* is of particular interest, because it is the constant and essential lesion of postvaccinal and postinfectious encephalomyelitis and the encephalomyelitis occasionally seen after antirabic inoculations It has however also followed arsenic injections (Russell 1937), although here the commoner picture is a hæmorrhagic encephalitis without any perivascular demyelination

FIG 5—Thoracic cord Loyez Ballooning of peripheral white matter in places, perivascular demyelination in deep white matter, hæmorrhages in grey matter and amorphous debris in subarachnoid space derived from the lumbar region during removal of the cord (× 8)

(2) *Vascular damage* was prominent Minute scattered hæmorrhages were present, and there was thrombosis of small arteries and veins particularly in the leptomeninges, and to a lesser degree in the cord Some vessels showed fibrinoid necrosis and frequent slight leucocytic infiltration of their walls In postinfectious encephalomyelitis a few small thrombosed vessels are sometimes seen, but not inflammatory changes in the vessel walls of the kind here apparent A case with very similar pathological changes was described by Bram and Russell (1937) following the administration of a spinal anæsthetic There was massive softening of the cord extending from T12 to L2, and focal areas of demyelination, not related to hæmorrhages in the higher segments In the affected areas veins showed endophlebitis or thrombosis, while arteries showed kinds of acute necrosis or "necrotising arteritis" Similar vascular changes have been reported in encephalitis following arsenic injections (Scott and Moore 1928 and Baker 1935), although no destruction of brain tissue was noted

(3) *Massive softening of the cord* has been described in encephalomyelitis following smallpox (Troup and Hurst 1930), after antirabic inoculations (Babes and

FIG 3—Thoracic cord Loyez Ballooning of myelin sheaths in superficial white matter (× 75)

FIG 4—Thoracic cord Loyez Perivascular demyelination in deep white matter (× 75)

Mironesco 1908), and after spinal anæsthesia (Brain and Russell 1937, Brock, Bell and Davison 1936).

NOMENCLATURE

The term encephalomyelitis has been used in describing these two cases, but it is not used in any specific sense. The condition found has certain pathological features in common with recognised types of encephalomyelitis, but this does not necessarily mean that the lesions have a similar origin. In defining the alternative term "myelomalacia" Walshe (1937) says that it has been applied to localised softening of the cord secondary to diminished blood-supply, especially due to thrombosis of its blood-vessels, as distinct from local destructions which may result from inflammatory conditions But such a distinction, he holds, is not justified; for thrombosis and ischæmia are a part of the pathological process of all traumatic, inflammatory and pressure lesions of the spinal cord, and may be terminal events in certain diseases of the cord in which vascular lesions of the cord are otherwise conspicuous by their absence. In my case 1 the inflammatory changes in the vessel walls, and thrombosis of vessels, the perivascular demyelination, and massive softening, may all have been the result of the same damaging agent.

It is possible that the massive softening of the lumbar cord was secondary to vascular occlusion, but similar softening has been reported in encephalomyelitis following smallpox (Troup and Hurst 1930), when no thrombosis of vessels was seen Again in arsenic encephalitis perivascular demyelination has been described when no thrombosis of vessels was present (Russell 1937), while others (Baker 1935, Scott and Moore 1928) have recorded cases showing vascular damage and thrombosis of vessels but no softening.

TOXICITY OF SULPHANILAMIDE

Very few affections of the central nervous system attributable to sulphanilamide have been reported. Bucy (1937) described a case of toxic optic neuritis apparently to be explained by idiosyncrasy to the drug. A girl with osteomyelitis was given sulphanilamide three times. On the first two occasions she had headache, cyanosis, diarrhœa and a choking sensation, and on the third she developed a toxic optic neuritis after taking a single tablet. Whitby (1937), speaking of the toxicity of sulphonamide preparations, stated that one case where the central nervous system was affected had come to his knowledge. Several cases of neuritis have been described following the administration of Uleron.

Van Valkenburg and Kreuzwendedich von dem Borne (1938) reported a case of polyneuritis developing after 16 g. had been given in two periods with a week's interval.

Alder and Markoff (1938) described two cases of polyneuritis after administration of uleron

Schubert (1938) reports a case of a man, aged 21, developing extensive softening of several segments of the thoracic cord after the administration of 15 g. of uleron, and later 15 g. of Diseptal B, with six days' rest between the courses. He appeared to be completely cured at the end of the course, and the symptoms of myelitis did not begin until fourteen days later. He had a fall while ski-ing, and sprained his knee. The next day he noticed numbness of the feet and weakness of the knees. It was considered that the fall was probably a factor in precipitating the lesion, but was not wholly responsible for it. The cerebrospinal fluid did not contain any blood, and there was no bony lesion, and nothing was found post mortem to suggest it could have been traumatic in origin. The gonococcal infection appeared to have cleared up completely.

It appears that patients suffering from lupus erythematosus and arthritis, and from acute rheumatism, are especially susceptible to the toxic effects of sulphanilamide.

Barber (1937) reported two cases in women with lupus erythematosus and arthritis. The first developed fever (102° F.) and diarrhœa, after taking 1·0 g. t.d.s. for ten days, and the second developed toxic symptoms after taking 0·5 g. t.d.s. for ten days. After a rest from treatment, another attempt to take the drug immediately provoked the same symptoms. Both patients seem to have become sensitised to the drug.

Swift, Moen and Hirst (1938), after treating 8 cases of rheumatic fever, concluded that its toxic action in this disease outweighs any benefit obtained.

In both my cases the toxic effects, if due to the drug, must be ascribed to idiosyncrasy rather than overdosage. The first patient, with lupus erythematosus and arthritis, had a total of 14 g, and the second, with tonsillitis and erythema nodosum, had 18 g. There is evidence also that the encephalomyelitis following arsphenamine injections is independent of the dosage. Cormia (1936), studying the records of 135 cases in which encephalitis was a sequel to arsenic injections, found that it usually developed after the second injection. It is not due to a Herxheimer reaction, since it has been seen in non-syphilitic subjects (Globus and Ginsberg 1933)

An emulsion of cord from the fatal case was inoculated intracerebrally into a monkey and 2 guineapigs, 2 rabbits and 12 mice, with negative results, and this is in keeping with the fact that encephalomyelitis showing perivascular demyelination has never been transmitted to animals No known virus causes this pathological picture, and there is at present little to support the theory that the encephalitis is caused by activation of a virus latent in the body.

It is known that certain persons develop unusual reactions after taking small amounts of some drugs The toxic manifestations they show are not those usually seen in overdosage from the particular drug. The cause of the idiosyncrasy is unknown. Occasionally, the symptoms appear after the first dose, and there seems to be a constitutional factor. Often, however, they come on only after a number of doses, and here sensitisation to the drug seems to have taken place. Once they become sensitised, a minute dose of the drug will bring recurrence of the symptoms. It is possible that the encephalomyelitis following sulphanilamide and arsenic is the result of such a reaction affecting the central nervous system.

The possibility of postinfectious encephalomyelitis being due to sensitisation has been suggested.

Summary

1. Two cases of encephalomyelitis following the administration of sulphanilamide are described, one of which ended fatally. The total doses taken were small (14 g. and 18 g.) and if the drug was responsible the patients must have been more than ordinarily susceptible to it.

2 There is evidence that patients suffering from certain illnesses—including acute rheumatic fever and lupus erythematosus—are especially liable to develop toxic manifestations after taking sulphanilamide

3. Vascular changes are seen in some cases of encephalomyelitis and their relation to the demyelinating lesions is discussed.

I wish to thank Dr J R Gilmour for his report and for the photomicrographs, Dr L T Bond for performing the post-mortem examination, and Dr Arthur Burrows, Dr R Sleigh Johnson and Dr T Rowland Hill for permission to publish the cases The late Dr J R Perdrau carried out the animal-inoculation experiments

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LOCAL TISSUE ANOXIA AND ITS TREATMENT

WITH SPECIAL REFERENCE TO RHEUMATIC MYOCARDITIS*

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Local Tissue Anoxia

NOTHING is commoner in special pathology than to ascribe to ischæmia from arterial disease the fatty degeneration, necrosis, or fibrosis of organs Ischæmia presumably acts by producing want of oxygen (*local tissue anoxia*), and yet no one has examined this problem systematically by observing the effect of breathing a high concentration of oxygen over a long period, even though benefit might be expected from such treatment in suitable cases There are three reasons for this omission (1) The term *local* tissue anoxia implies normal saturation of the arterial blood with oxygen, otherwise all the tissues would be anoxic, the frequent use of the term anoxæmia for this condition has obscured the problem (2) Until the last few years there has been no convenient method of giving oxygen in high concentration for more than a few hours at a time, and it has been considered inadvisable (Boothby 1938) (3) Most important of all, it has been argued that, because the normal arterial blood is 95 per cent saturated with oxygen, no good would be obtained by completing the saturation to 100 per cent One well known author speaks of anoxæmia as the 'kind of oxygen want that is capable of relief by oxygen inhalation" as if the other kind could not be relieved in this way This is perhaps a fair presentation of the views of clinical workers in this field up to date, though, to judge from a lecture given on May 7 1930, by Dr W Lovelace at Guy's Hospital, some American opinion is fast coming round to the views advocated in this paper

There are observations proving that breathing oxygen can relieve local anoxia (1) Campbell and Hill (1931) and Line et al (1936) have shown that when man breathes oxygen nitrogen is driven out of the body and oxygen must presumably take its place, (2) Campbell (1925), after injecting air beneath the skin and into the peritoneal cavity of animals found that the partial pressure of oxygen in these collections of gas was increased by breathing oxygen (3) Behnke et al (1934) found that under high oxygen pressure the mixed venous blood contained more oxygen than there was in the arterial blood when the animal was breathing air, showing that the hæmoglobin had probably undergone no reduction at all as it passed through the systemic circulation, tissue respiration being carried out entirely by means of oxygen in solution, and (4) Krogh (1922) has pointed out mathematically that oxygen consumption in muscle depends on the difference between the capillary oxygen pressure and the tissue oxygen pressure and is least in parts removed from open capillaries, where there may be a temporary lack of oxygen Breathing oxygen must cause a rise in capillary oxygen pressure and facilitate the absorption of oxygen, as shown by Hill, Long, and Lupton (1924) during muscular work in man and by Hill and Flack (1909), who found that athletes were able to improve their performances Boothby (1938) has compared the volume of oxygen dissolved in the plasma when the subject breathes oxygen with that combined as oxyhæmoglobin, but volumes do not enter into Krogh's formula Oxyhæmoglobin is to be looked upon merely as a store from which the body obtains oxygen without too great a fall of partial pressure

CORONARY THROMBOSIS

Although there has been no systematic study of the use of oxygen in local tissue anoxia, observations are available in three instances· (1) Hill (1921) claimed that there was considerable improvement in two cases of chronic ulcer of the leg with local œdema, (2) it has been suggested that certain drugs —e g, alcohol and cyanide—act by preventing the cells from absorbing oxygen—"histotoxic anoxia'—and Barach (1934), among others, has shown that oxygen is certainly beneficial in acute alcoholism While admitting the benefit, some have doubted the anoxic hypothesis which would explain it, and certainly the fall in concentration of alcohol in the blood under oxygen (Robinson and Selesnick 1935) suggests another possible explanation—e g, an oxidation of the alcohol which is poisoning the cells It is desirable to obtain further proof that local tissue *anoxia can exist*

(3) *Coronary thrombosis* —Levy and Barach (1930) treated with success four patients in an oxygen tent, and I described benefit in one case (Campbell and Poulton 1934) The rapid cutting off of the arterial supply, the secondary infarction, and the intermixture of blood-clot and injured muscle fibres from subsequent hæmorrhage all suggest local tissue *anoxia* and the deviation of the S–T interval from the iso electric line in the electrocardiogram (E C G) provides a proof for this physical sign indicates local want of oxygen (Dietrich and Schwiegk 1933, *Büchner 1938*) *In spite of this, oxygen plays* practically no part in the treatment of this condition in this country It is not mentioned in many textbooks or in discussions at medical societies (*Lancet* 1939) It is because in my experience oxygen is the most valuable drug we possess for coronary thrombosis improving the heart's action and relieving pain that these further two cases are described

CASE 1.—A mess room attendant, aged 50, had had seizures 12 and 34 years ago and mild attacks for the last 20 years after hard muscular work The symptoms were nausea, dizziness, swelling of the chest (constriction) sweating, and weakness of the

* A paper read before the Association of Physicians

legs. On the present occasion he staggered to a bench and lay down, remaining conscious.

On admission to Guy's Hospital under Dr. R. T. Grant at 1 P.M. on Nov. 25, 1938, there was pain in the chest and a sense of dissolution; the radial pulses and apex-beat were impalpable; the heart-rate was 130 and the heart's action irregular. By 1.40 P.M. he was in a tent with 75 per cent. oxygen. When examined at 11.15 P.M. he was better, the heart-rate was 80, and the radial pulse was just palpable; blood-pressure 100/81, rising to 120/70 on the 27th and 140/90 on the 29th, when the tent was removed. There was a polymorphonuclear leucocytosis and variations in the P and T waves of the E.C.G. indicating coronary thrombosis. There was no S–T deviation, possibly because he was immediately treated with a high concentration of oxygen. He was discharged on Dec. 20.

CASE 2.—A lady, aged 82, had had a severe attack of what was evidently coronary thrombosis in about 1912 and anginal pains for the last two or three years, especially when walking against a wind. There were two severe attacks at night on Oct. 1 and 14, 1938. On the 16th the blood-pressure was 170/110. On the 23rd at 10 A.M. she had a severe attack of pain and was pulseless, and immediate death was feared. She was in a tent with 45–50 per cent. oxygen by 5 P.M. and stayed there for the night. She improved, her blood-pressure being 105/70. On the 24th the E.C.G. showed S–T deviation, most marked in lead 3, which was much less on Nov. 3. The other changes were compatible with the diagnosis.

For the next six months she had oxygen, mostly at night, with a tent or forked nasal tube. Its effect in raising the blood-pressure and relieving pain was observed many times. In February, 1939, the blood-pressure varied between 100/75 and 145/95, according as oxygen was given. In the day-time she led the life of an invalid but was wheeled out of doors and went for drives. The value of the tent over the forked tube was illustrated by her last severe attack of pain twelve hours before she died. She was unconscious, dyspnœic, and cyanosed after morphine, in spite of a flow of oxygen at 6 litres and later 8 litres a minute. As soon as the tent was applied with 70 per cent. oxygen, she became conscious and then had natural sleep for about six hours. According to present experience a higher concentration of oxygen and a longer continuous period in the tent at the outset are indicated.

LOCAL CEREBRAL ANOXIA

It will be evident, from what has been said so far, that local tissue anoxia may play an important part in clinical medicine, and its treatment with an "airtight" tent may produce on occasions brilliant results. The airtightness of the tent must be emphasised not only because oxygen is economised but also because a constant high percentage is more readily obtained. It would serve no useful purpose merely to enumerate those diseases in which on theoretical grounds this treatment might prove to be of value, without producing experimental evidence; this is a subject for future investigation. However, there is one condition I must mention before approaching the main subject of this paper. If coronary thrombosis causes local anoxia of the heart muscle, will not cerebral hæmorrhage, thrombosis, or embolism produce local anoxia of the brain, particularly since it is now recognised that the central nervous system has a high basal requirement of oxygen? So far I have treated half a dozen cases. More are necessary for the purpose of estimating the prognosis, with and without oxygen; but two of the cases show points in its favour.

CASE 3.—A girl in the Downs Hospital, aged 12, with rheumatic heart disease, had a sudden attack of aphasia and hemiplegia, which remained unchanged for four days, after which an oxygen tent was used; two days later improvement in speech was noticed, which continued in the tent.

CASE 4.—A fish-porter, aged 39, was admitted to Guy's Hospital on Sept. 28, 1938, semiconscious, with right hemiparesis; blood-pressure 210/130. He gradually became unconscious, and the paralysis increased till on the 30th he lay like a log. At 6 P.M. an oxygen tent (60–70 per cent.) was used. The next morning he came round sufficiently to want to sit up and could answer "yes" and "no." Incontinence was noticed. On Oct. 3 he was fully conscious and could move his right arm and leg. The oxygen was lowered to 40–50 per cent. at 5 P.M. The next day he was taken out of the tent, he could talk normally, the right side of his face was weak, but improved, and he was still doubly incontinent. He remained in statu quo till the night of the 10th, when he became worse. He had difficulty in speaking at 8 A.M. on the 20th and was restless and unconscious in the afternoon, when he was put back in the tent. He died at 6.45 A.M. on the 21st, and at autopsy there was a black organising clot obliterating the left internal capsule and no recent hæmorrhage. The improvement with oxygen, after the progress downhill during the first three days in bed, and the relapse from the effect of the original hæmorrhage fifteen days after removal of the tent both suggest that oxygen was valuable but was not used long enough.

Rheumatic Myocarditis

The points in favour of a local tissue anoxia in rheumatic myocarditis are as follows:—

(1) The histological picture of Aschoff node formation in the myocardium, so often described, has been epitomised as a panarteritis with thrombosis of the lumen in places and peri-arterial fibrosis (Gadrat 1938). Associated with this there is cloudy swelling, diffuse or in patches, later fatty metamorphosis of the muscle cells, and latest of all a dystrophic change, seen best in the auricular wall in mitral stenosis, where the muscle substance disappears, leaving a delicate web of sarcolemma. Coombs (1924), who described these changes, ascribed them to inflammatory toxins; but why should not they be due to anoxia secondary to the panarteritis?

(2) Asphyxia in cats causes lengthening of the P–R interval, missed beats, and 2 to 1 heart-block (Lewis 1925), conditions met with clinically in acute rheumatism, and recently the S–T deviation from the iso-electric line, which is also commonly met with in acute rheumatism, has been attributed to want of oxygen (Dietrich and Schwiegk 1933, Büchner 1938).

(3) Repeated small blood-transfusions are beneficial in rheumatic myocarditis (Horvath 1938), and these would increase the supply of oxygen in a disease characterised by a low hæmoglobin percentage.

LACTIC ACID

If there is anoxia of the heart muscle, an increased production of lactic acid would be anticipated. This might show itself in an increase of the blood lactic acid and/or of the amount excreted. An investigation took place at the Birmingham Children's Hospital, and Dr. E. M. Hickmans, biochemist to the hospital, has kindly allowed me to quote some of the conclusions. The patients were afebrile and in bed; 94 estimations of blood lactic acid at about 10 A.M. in rheumatic cases and 62 in controls were made by Friedmann's method and 26 in rheumatic cases and 11 in controls by the method of Avery and Hastings. The lactic acid of the urine was determined 103 times in rheumatics and 68 times in controls, usually for a period of twelve hours. The average percentage of lactic acid in the blood by both methods and in the

urine excreted in twelve hours and the range (highest and lowest figures) were the same in the two groups, but the distribution curves differed There were more high and low values for the blood lactic acid in the rheumatic series than in the controls There were also more high values for the excretion of lactic acid in the rheumatics than in the controls There was therefore a difference in the metabolism of lactic acid in the two groups, which might be explained by an increased production of acid in some cases of acute rheumatism

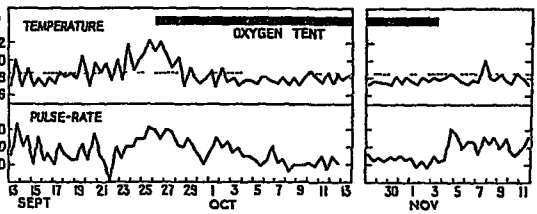

FIG 1—Fall of temperature and pulse rate in oxygen tent in a case of acute rheumatism with rise on coming out

A further investigation on the effect of oxygen on the metabolism of lactic acid is now being carried out in London, and Mr H J Taylor, Ph.D, working on behalf of the Empire Rheumatism Campaign, is kindly collaborating with me He has allowed me to quote the following typical case —

CASE 5.—A man, aged 39, was admitted to Lewisham Hospital on March 9, 1939, with acute rheumatism, pleurisy, and pericarditis The anti-streptolysin titre was 1250—ten times the normal There was a considerable fall in blood lactic acid while the patient was in the tent—i e, from 19·2 mg to 9·0 mg per 100 c cm.—and a considerable rise on the day after coming out—i e, to 23·1 mg.—when the pulse-rate and temperature were above normal, with a gradual fall later on

This suggests that the oxygen relieved the local anoxia of the heart muscle As might be predicted from the work in Birmingham, such striking changes do not take place in all cases of rheumatic myocarditis, nor are they present in the controls

OXYGEN THERAPY

The remainder of this report is based on a study of 26* rheumatic patients (15 in their first attack), treated with oxygen for periods varying from about a week up to eighty two days, at Guy's Hospital, Lewisham Hospital, Queen Mary's Hospital, Carshalton, and the Downs Hospital, Sutton The attempt was made to keep the oxygen percentage in the tent at 60–70, this could not be effected in a leaky tent The patient usually remained in the tent continuously, but after two or three weeks some patients were allowed out once a day for an hour to prevent boredom In wards where the technique was unfamiliar the patients came out twice a day for washing A control series of 33 cases of acute rheumatism (17 of them in their first attack) is available for comparison, these cases were mostly at Queen Mary's Hospital In 17 out of 19 cases treated with oxygen the anti streptolysins of the blood were abnormally high, emphasising the relationship of acute rheumatism to the hæmolytic streptococcus

Subjective clinical condition —In 17 of the 26 cases clinical improvement was noticed The patients felt better, they were more active and ate more, and cyanosis disappeared, one could "breathe better" The *improvement was most obvious in very ill patients*, such as one with pericarditis, nephritis and purpura, who was so ill that a note was made that oxygen had probably saved his life, another who had made but little recovery from a pericarditis; and another with pneumonia and pericarditis All these were children Improvement was noticed whether the acute rheumatism was a first attack or accompanied by an old-standing cardiac lesion Adult patients also felt better—e g, one with purpura and pleurisy besides an old mitral stenosis, one with pericarditis, pneumonia, and nephritis, and one with pleurisy and pericarditis

In 8 cases there was no clear subjective improvement 4 *patients did not feel unwell beforehand* Another patient, who developed tachycardia after tonsillectomy fifty three days previously, did not respond and only showed a temporary fall of pulse rate Another patient's appetite failed, though there was a favourable effect on the pulse and he was taken out after fifteen days Two patients had severe heart failure Barach and Richards (1931) noticed that oxygen did not cause much improvement in this type of case, though one of their patients collapsed after removal from the tent and had to be put back

This distinction was noted in a case in which an enlarged cardiac shadow indicated pericarditis On Aug 6, 1938, at Guy's Hospital, the patient did well in the tent, but the value of prolonged treatment was not realised and he was taken out after two days Two and a

* A further description of these cases in tabular form will be sent on application to the author

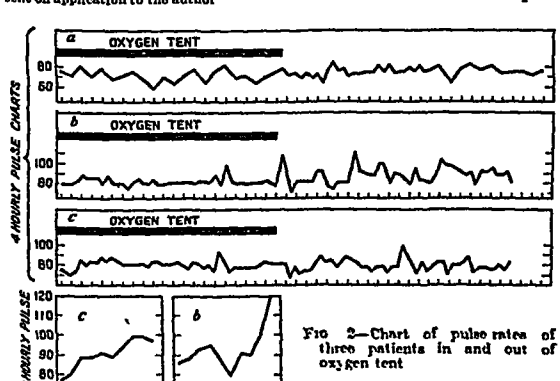

FIG 2—Chart of pulse rates of three patients in and out of oxygen tent

half months later, at Queen Mary's Hospital, he was put in the tent for thirty-five days; there was massive œdema, scanty urine, and an enlarged liver; he died soon after coming out. Hence oxygen should not be left till the last stages of rheumatic heart disease. In 2 cases without pericarditis radiograms showed that the width of the heart became smaller after treatment with oxygen.

Temperature and pulse-rate.—In 14 cases there was no fever at the time the tent was used, though in

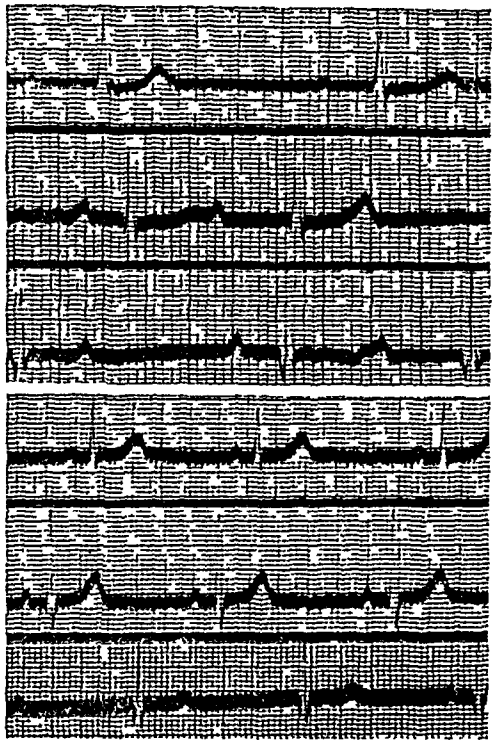

FIG. 3—Electrocardiograms in a case of acute rheumatism: (A) 29 XII 38, showing 2 to 1 heart-block and fall of S–T in lead 1 slightly below the iso-electric line, (B) 3 I 39, heart-block and S–T deviation have disappeared

most cases there had been recent fever. Fever was present in 12 patients, and all reacted with a fall of temperature in the tent, though in 2 the fall was slight. A striking example is illustrated in fig. 1. Salicylates and sulphanilamide, which might cause a fall of temperature, were not given in 8 of the 12 cases. In some the temperature rose again on removal of the tent, and it may rise again before the tent is removed. The temperature falls in pneumonia when a patient is at first treated in a tent, though it usually rises again later. This fall of temperature in two unrelated diseases suggests that tissue anoxia may be a factor in the formation of metabolic products responsible for fever.

A fall of pulse-rate was not brought about so readily as a fall of temperature (fig 1), but it was observed in 22 cases, though in some the fall was slight. In 18 cases the pulse-rate rose on removal of the tent. The rise in 2 mild cases is shown in fig. 2*b* and *c*; it began within an hour of leaving the tent. After this rise the pulse-rate may settle down again to a normal figure in the course of a week or so. In 1 case there was little or no rise of pulse-rate when the tent was removed (fig 2*a*). Presumably the treatment had been carried out long enough in this case.

Alteration of murmurs with oxygen treatment was noted in 15 cases—11 with a first attack and 4 of old standing: (1) there was a diminution of intensity or a disappearance of a systolic and/or mid-diastolic murmur in the tent in 10 cases, and reappearance with increased intensity outside the tent, (2) the first sound became louder in the tent; and (3) the quality of murmurs changed. For instance, a systolic squeak disappeared, though it became faintly audible on occasions later on, while the patient was still in the tent. There was also a temporary disappearance of a squeak in 1 case during the second treatment.

In 10 cases no change was noted. In 4 the murmurs were either very soft or absent; 5 were of old standing, and in 1 pericardial sounds overshadowed the murmurs.

Electrocardiograms.—More than one E.C.G. and sometimes serial E.C.G.s were taken in 18 cases. Only occasionally was the E.C.G. taken with the patient in the tent; this is not so important, for the effect of the oxygen probably lasts some time after the patient's removal from the tent; at any rate there is not much rise in pulse-rate for half an hour. E.C.G.s were taken, unrelated to oxygen treatment, in a control series of 27 rheumatic cases.

The rheumatic patients treated with oxygen and the controls showed improvement in the same proportion so far as low voltage was concerned, but this sign is rather uncertain, for it is readily produced by drying of the electrodes. There was frequently slight deviation of the S–T interval, which is taken to mean local want of oxygen (fig 3*a*). It was always much less than that commonly observed in coronary thrombosis or in old-standing myocardial disease. In all the 4 cases in which it was present it improved with oxygen, and in only 3 out of the 16 cases of the control series in which it was present. One case showed slurring of the S wave, which became normal after five days in oxygen. The change from upright to inverted T waves and vice versa took place in 12 per cent. of patients treated with oxygen and in 30 per cent. of control cases during the period of observation.

In 16 cases treated with oxygen the P–R intervals could be compared. A length up to 0·18 sec has been allowed as normal for a child and 0·20 sec for an adult. In 8 cases the interval was normal. In 6 it was long and became normal with treatment. One of these patients, just before going into the tent, had classical 2 to 1 heart-block with increasing P–R interval and pulsus bigeminus (fig. 3*a*). Five days later, in oxygen, a normal P–R interval was obtained (fig. 3*b*). The pulse was regular and normal in rate three days after going into the tent; hence the heart-block may have disappeared by then. In 2 cases the P–R interval was long and became normal, but on one occasion in each case lengthening was again observed. Both of these patients have so far done well clinically. A study of the P–R interval was possible in 17 control cases. It was normal in 7 cases. In 6 it was too long, and in only 2 of these did it become normal—a contrast to the cases treated with oxygen. In 4 cases it was variable, lengthening and shortening at different times. The conclusion is that oxygen produces improvement in the electrocardiogram.

Later improvement with oxygen treatment.—For this assessment it is better to avoid cases with permanent cardiac damage but to consider patients in their first attack, in which improvement or recovery is more

likely As the time since oxygen treatment is short —two to ten months (average four and a half)—the conclusions are provisional Only 7 of the 15 cases in their first attack are available, as in the others the time of observation since treatment has been shorter than two months The result is considered to be good if (1) only a soft systolic murmur was present before treatment and this has disappeared, or (2) a canter rhythm or diastolic or presystolic murmur or a third or fourth heart sound (McKee 1938) or a loud blowing or musical systolic murmur with a weak first sound has disappeared and the only auscultatory signs remaining are a soft systolic murmur with a good first sound and/or an accentuated and sometimes reduplicated pulmonary second sound, the reduplication being usually heard towards the end of inspiration, or (3) a pulse-rate previously rapid now remains normal not merely as charted but also when the physician examines the patient With these criteria the results in 6 of the 7 cases are good The seventh patient, who was only in the tent thirteen days, has a rapid pulse rate with a systolic murmur after two and a half months—a poor result These were all severe cases when first treated, and the time in the tent was too short in 2 cases One patient, who writes happily from Eire and wants to come back as wardmaid at Guy's Hospital, is not included in this series

A control series of 16 cases at Queen Mary's Hospital observed over the same period tells a different story In 2 patients with systolic murmurs the cardiac condition cleared up in less than a month in one and in eleven weeks in the other Another patient began with nodal rhythm, ventricular escape, and presystolic and systolic murmurs, after two months there were a systolic murmur and good first sound, and the pulmonary second sound reduplicated on inspiration These 3 results are good The remaining 13 are poor: in 2 soft systolics appeared and have persisted for nearly nine months in one and over two months in the other, and in 2 there were loud systolic murmurs and weak first sounds, in 5 there remained mid diastolic murmurs or their equivalents, in 2 there remained aortic diastolic murmurs, and in 2 there was tachycardia, with a late blowing systolic in one Most of the patients treated with oxygen were more acutely ill than the controls, this is also suggested by the anti-streptolysin titres, which were on the average 630 and 268 in the two series The numbers are small, and this section should only be looked on as an appendix to the rest of the paper, but the number of good results is so different in the two series that oxygen may have made a difference to the prognosis Further work along these lines is required

Conclusions

(1) The importance of local tissue anoxia and its treatment with oxygen has not hitherto been recognised, except that success has been claimed for oxygen therapy in varicose ulcer with local oedema, poisoning with alcohol, and coronary thrombosis

(2) The inhalation of a high percentage of oxygen may have a wide application in treatment, its use in cerebral hæmorrhage, thrombosis, and embolism is suggested

(3) The evidence that there is local anoxia in rheumatic myocarditis is (*a*) a changed lactic acid metabolism, and (*b*) clinical improvement on treating patients with oxygen, resulting in fall of temperature and pulse rate, alteration of murmurs, diminution in the size of the heart, and electrocardiographic changes Oxygen treatment in early cases appears to be of permanent benefit, but in this connexion further observations are required

I wish to thank Sir Frederick Menzies for allowing me to quote cases at L C C hospitals, Mr E M. Heckmans, Ph D, and Drs N Gray Hill, George Melton and E W Todd for their coöperation, and the Medical Research Council for an expenses grant

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TESTS FOR ATHLETIC EFFICIENCY*

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The subject of physical fitness is very much in the air The Government has considered it desirable to institute an elaborate investigation Our profession will naturally be consulted, our opinion will frequently be requested, on very rare occasions it may even be paid for That is my excuse for bringing forward so elementary a communication

I have to restrict myself to a very limited aspect of the subject Physical fitness and athletic efficiency are not by any means the same thing Fitness I conceive to be *satisfactory* adjustment to one's environment, the term being used in the widest sense A man may be fit to climb the Matterhorn yet quite unfit to endure the strain of city life, fit to row from Putney to Mortlake yet quite unfit to undertake the duties of a resident in a fever hospital And clearly the reverse also holds good The assumption of "fitness" involves a number of factors, some of which cannot be assessed at all So I restrict myself to the subject of athletic efficiency, which is to some extent at any rate directly measureable

RESPONSE OF CIRCULATION TO EFFORT

For practical purposes the comparatively simple methods in common use to estimate the physical efficiency of the healthy athlete are probably as satisfactory as the more elaborate investigations which are, after all, only extensions of fundamental principles In general we depend on the response of the circulation to effort, as denoted by cardiac acceleration or by variation in blood

* A paper read before the Association of Physicians

CRAMPTON'S TABLE OF NUMERICAL STANDARDS OF FITNESS

Pulse-rate increase	Systolic blood-pressure (mm)										
	Increase						Decrease				
	10	8	6	4	2	0	2	4	6	8	10
0–4	100	95	90	85	80	75	70	65	60	55	50
5–8	95	90	85	80	75	70	65	60	55	50	45
9–12	90	85	80	75	70	65	60	55	50	45	40
13–16	85	80	75	70	65	60	55	50	45	40	35
17–20	80	75	70	65	60	55	50	45	40	35	30
21–24	75	70	65	60	55	50	45	40	35	30	25
25–28	70	65	60	55	50	45	40	35	30	25	20
29–32	65	60	55	50	45	40	35	30	25	20	15
33–36	60	55	50	45	40	35	30	25	20	15	10
37–40	55	50	45	40	35	30	25	20	15	10	5
41–44	50	45	40	35	30	25	20	15	10	5	0

pressure; and since the reaction of the vasomotor system is the essential criterion, it may be regarded as sufficient to ascertain the alterations which occur in changing from the horizontal to the vertical position, even if effort is entirely eliminated by strapping the subject to a tilting table. In a fit subject the vasomotor system quickly adjusts itself, and the increased vasomotor tone is demonstrated by a small rise in blood-pressure; in the unfit the veins fill first and the cardiac rate accelerates by way of compensation for the sudden fall in arterial pressure—doubtless a carotid-sinus reflex.

C. Ward Crampton has constructed a table which gives a numerical standard of fitness based on this change of posture (see the accompanying table). A perfectly efficient circulation would be denoted by the 100 mark; at 0, unconsciousness would result on the assumption of the erect attitude.

On the whole, I believe any method into which blood-pressure estimations enter to be fallacious. The influence of emotion is often considerable in the highly sensitive nervous type not infrequently encountered among track athletes

40 MILLIMETRE TEST

The "40 millimetre test" is particularly favoured by the Royal Air Force Medical Service. In this test the subject sits with his nasal respiration occluded with a clamp, and, by expiring through a suitable mouth-piece, sustains a column of mercury at the height of 40 mm so long as he is able Meanwhile the observer takes the pulse-rate during each succeeding period of five seconds In a satisfactory test the pulse-rate remains almost unaltered for a minute or longer; in bad results the duration is brief and the pulse-rate fluctuates *It is not exactly clear what is actually tested.* One explanation is that tone of the abdominal walls is the important factor, another supposes that positive pressure on the thoracic contents impedes diastolic filling, and that the state of the ventricular wall is thus tested. Yet I doubt if the ventricular musculature has anything to do with it—I am considering, of course, the athlete in whom pathological changes are presumably absent. Probably anoxia resulting from deficient circulation is the essential factor; and, as we know, people differ enormously *in their reaction to anoxia*

In my experience with athletes this test is of little if any value: the fittest men sometimes exhibit extremely bad results, and good results are often encountered in subjects who are not particularly athletic, however suitable they may be as aviators. I am reminded, however, by the Air Force authorities that the test is far from foolproof; it requires practice by the subject and some experience and skill on the part of the observer to produce a legitimate result. With a little practice and proper coöperation between subject and observer repetition of the test may lead to such a degree of improvement as to prove how much depends on technique in its performance

DECELERATION

The relation of the cardiac rate to exercise is so obvious a criterion, and its investigation is so simple, that it must naturally make the strongest appeal as a test of efficiency. *It must be remembered that, although* the heart looms largely as a superlative factor in exercise (in my opinion far too largely), it is only one of the elements concerned in a problem into which also enter the lungs, the blood, the skeletal muscles, the skin, and the nervous system (including the higher centres), besides a coördinating factor which is probably *within the province of the biochemist.* But, since the object is to estimate physical efficiency in the healthy subject, the isolation of any one factor is of no importance

Any method which provides a form of muscular exertion may be utilised as a system of graduated exercise to afford a measure of the work done and the stress imposed. *Among methods in common use* are the lifting of a weight through a measured distance a prescribed number of times, and the use of a pulley for the same purpose Again, the subject may run up and down a flight of stairs in an approximately fixed time, step on and off a chair of standard height at a given rate, raise and lower the arms, bend the trunk, or pedal a stationary bicycle. It is a pity that those of us who are interested in tests of efficiency have not agreed on a standard effort. At present each of us employs his own method, so that results are not comparable I am considering in this connexion only perfectly healthy subjects, and to estimate this condition of training I apply as violent an effort as I have been able to devise to occupy twenty seconds The degree of cardiac acceleration I do not consider to be of any great consequence; for, after all, cardiac output may be increased in one subject mainly by acceleration and in another by increasing the stroke volume. But the rate of deceleration I believe to be a valuable index of fitness. As a rule, deceleration begins within 10–15 sec of the cessation of exercise and continues regularly with

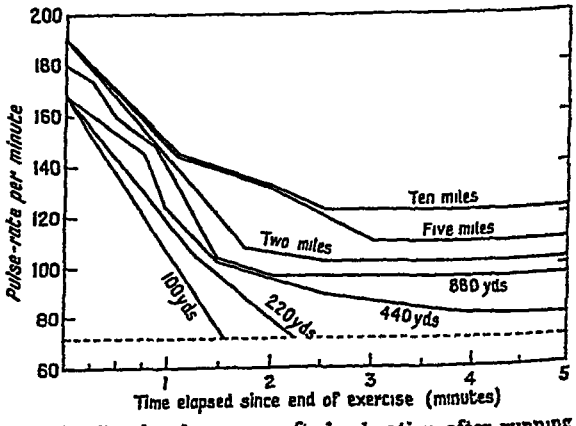

FIG 1—Graphs showing swift deceleration after running short distances.

a return to the resting rate within 45 sec But in a few outstanding examples, of whom the leading British runner of the present day is one, a different result has been noted the tachycardia persists for approximately ¼ min and suddenly yields to the resting rate It seems as if the circulatory system works on two gears, so to speak There must be some "clicking over" of a nervous regulatory mechanism, but I cannot find a satisfactory physiological explanation This simple test I have found to be an adequate guide to fitness during training, a bad result encourages a search for the cause, usually a toxin. Incidentally, I may say I am appalled at the carelessness of the average athlete in elementary hygiene (septic teeth and tonsils, neglect of the bowels, boils, and various skin eruptions)

A striking example was a recent champion quarter-miler Although occasionally brilliant his form was erratic, and I found corresponding variations in this exercise tolerance test The only physical disability identified was pruritus ani, for which he had undergone much treatment, including Ball's operation A surgical colleague discovered an intermittent discharge from a congenital fistula Apparently, occlusion from time to time led to absorption of septic and toxic

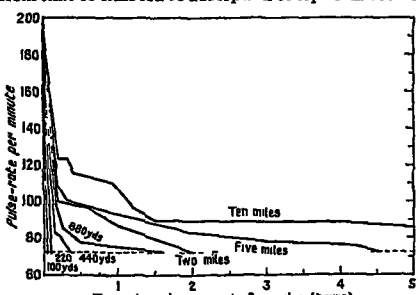

FIG 2—Deceleration after running distances from 100 yards to 10 miles

material, and a free discharge to discomfort but to relative athletic fitness After appropriate surgical treatment the exercise-tolerance test at once became satisfactory and constant, and correspondingly his efficiency was practically demonstrated by a record performance

RUNNING TEST

Now, although the various efforts mentioned are satisfactory for a short experiment, their psychical value is exceedingly low: in their continued performance boredom rapidly ensues, and they are not applicable beyond a comparatively short duration To extend this physiological investigation to any desired extent I selected the exercise of running Granted a constant velocity, it remained only to run over a series of measured distances to obtain a mathematical representation of the exercise taken An experienced runner can develop an automaticity which within his natural limits is almost perfect I have seen a good middle distance runner undertake to complete three miles in 15 min and exactly achieve this performance with a variation of not more than ½ sec. in each quarter mile

In my own case many tests under differing conditions led to the conclusion that—at the time during which the observations were made, not, alas, at the present day—my automaticity provided no greater error than 0·8 per cent over a maximal distance of ten

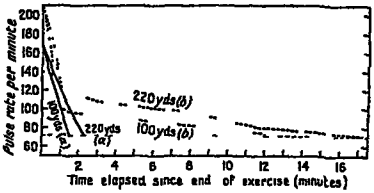

FIG 3—Comparison between fixed automatic rate (*a*) and extreme effort (*b*) of running

miles at a rate of 6 min 23 sec for each mile (0·8 miles in the hour) With this speed as the fixed rate, such orthodox distances were run as 100 yards, 220 yards, quarter, half, and one mile, two, five and ten miles, and observations of the pulse rate were taken

Two assistants were employed, one to count the pulse and report at the end of every 5 sec to his colleague, who noted the figures The fall in rate is so rapid (fig 1) during the first 2 min that such brief intervals must not be exceeded, afterwards it suffices to count for 15 sec every ½ min, then every alternate ½ min and later for 1 min every 5 min, until during the protracted observations following the long runs the pulse rate is noted at half hourly intervals

Fig 1 shows that, whatever the duration of the exertion, the rate of immediate deceleration is always very rapid After the shortest effort—100 yards—the resting rate has already been reached after only 1½ min rest, and even in the case of the ten miles run a substantial reduction can by this time be noted As the duration of the exercise increases, the return to the resting rate becomes correspondingly prolonged Thus, in regard to the ten miles run, although the pulse rate has fallen to 0·5 at the end of 1½ hours (fig 2), it is not until another 7½ hours has elapsed that the normal is reached.

As a supplementary experiment these results may be compared with those obtained after extreme exertion The application of this experiment is necessarily limited, for no man can be expected to put forth the extreme effort of which he is capable over more than a certain range, depending partly on his natural ability and partly on his athletic experience In my case, half a mile was the limit, but, since for scientific observation it was impossible to repeat such experiments upon many occasions, results are appended corresponding only to the distances of 100 and 220 yards.

In fig 3 a comparison between the fixed automatic rate (*a*) and the extreme effort (*b*) is shown, and from these it becomes evident that deceleration of cardiac rate is no absolute guide, inasmuch as the severity of running a furlong at full speed, as judged subjectively by the sense of exhaustion and distress, is greater than that experienced after a run of several miles at the slow automatic rate Delayed deceleration, then, is related to duration of exercise which in some way must lead to a block upon vagus inhibition, unless it is of purely cardiac origin—exhaustion of its glycogen supply, for example, with subsequent functional disability

THE SUPER ATHLETE

Finally, a word on the super athlete It is natural to desire to identify some factor which makes for supremacy, it is only to be expected, however,

that any such search will be disappointing. After all, although the objective superiority on the track of the super-man (the Olympic champion) over the generally accepted "first-class" athlete is very striking, numerically considered it amounts to only perhaps 4 per cent. Such a difference, if depending on anatomical conformation making for better leverage, would be outside the range of accurate measurement, furthermore, the difference might be some tiny superiority in muscle chemistry or other biochemical factor. When all is said and done, it is a question of coordination of all the various factors working in harmony. Even so mechanical a structure as a motor engine presents the same problem: the perfect chassis is produced when all the parts concerned in locomotion are exactly right at the right moment. And when, as in the case of the human machine, vital phenomena are added, it is not remarkable that no one outstanding criterion can be identified.

SUMMARY

(1) Athletic efficiency is usually tested by the response of the circulation to effort or to other factors influencing cardiac acceleration or blood-pressure.

(2) Every test involving blood-pressure is fallacious, because of the emotional factor.

(3) The rate of cardiac *deceleration* after a short intense effort is a valuable index of athletic fitness.

(4) For investigation of the effect of prolonged effort, the ordinary tests are impracticable. Running various distances is suggested as a more satisfactory method, and examples of its application are given.

BIOLOGICAL EFFECTS OF THE SYNTHETIC ŒSTROGEN HEXŒSTROL

4 : 4'-DIHYDROXY-γ : δ-DIPHENYL-*n*-HEXANE

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THE œstrogenic activity of the synthetic substance 4 : 4'-dihydroxy-γ : δ-diphenyl-*n*-hexane (hexœstrol) has been described by Campbell, Dodds, and Lawson (1938) They found that doses of 0 15 μg administered to ovariectomised rats gave an œstrus response in 60 per cent. of animals, whereas a dose of 0 1 μg. gave a 20 per cent. response It appeared that this substance, therefore, was more active than either diethylstilbœstrol (Dodds, Lawson, and Noble 1938) or 4 : 4'-dihydroxy-γ : δ-diphenyl-β : δ-hexadiene (Dodds, Golberg, Lawson, and Robinson 1938) in producing vaginal œstrus In the present paper the œstrogenic activity of hexœstrol has been compared with these other substances and its general biological effects have been studied

BIOLOGICAL ACTION

Rabbit uterus —The action of hexœstrol on the uterus was determined in ovariectomised rabbits. It was found that 100 μg of this substance given over seven days sensitised the uterus so that subsequent injections of progesterone were followed by typical uterine proliferation. Hexœstrol in large doses (10 mg.) caused uterine hypertrophy without proliferation of the mucosa

Mammary growth.—Male guineapigs about 200 g. in weight were injected subcutaneously every other day for twenty days. The total dose of hexœstrol was 200 μg. Growth of the nipples and development of the mammary tissue were observed.

Anti-implantation —It was previously shown that stilbœstrol would effectively prevent implantation of the embryo in rats (Parkes, Dodds, and Noble 1938) The hexœstrol was tested, therefore, in a similar manner. Female rats were allowed to mate, as shown by the vaginal plug, and on the following three days received various doses of hexœstrol in oil by mouth The total dose and the effect on implantation are shown in table I. A total dose of

TABLE I—EFFECT OF HEXŒSTROL ON IMPLANTATION

No of rats	Total dose of (hexœstrol μg)	Pregnancies
10	0	9
5	1	5
5	10	2
5	25	1

25 μg. of hexœstrol prevented pregnancy in 4 out of 5 animals, and 10 μg. was effective in 3 out of 5 rats This substance, therefore, appears to be as equally effective by mouth in preventing implantation in the rat as was stilbœstrol.

Other effects —In preliminary experiments hexœstrol was found to produce effects similar to those produced by stilbœstrol (Noble 1938) when administered to rats for twenty-eight days These were characterised by a reduction of body growth in adult rats and by a severe atrophy of the gonads with a secondary atrophy of the accessory organs in the male.

ŒSTROGENIC ACTIVITY

Immature rat uterus —Immature female rats weighing 40–45 g. received subcutaneous injections twice daily for three days and were killed on the fifth day. The synthetic œstrogens were made up in alcoholic solution and diluted with water to the required concentration. At autopsy the uteri were dissected and fixed in Bouin's solution and later weighed after removal from a 70 per cent solution of alcohol The results obtained with stilbœstrol and hexœstrol are shown in table II Although the

TABLE II—COMPARISON OF ŒSTROGENIC ACTIVITY OF HEXŒSTROL AND STILBŒSTROL ON IMMATURE RAT UTERUS

Substance	No of rats	Total dose (μg)	Vagina	Average weight of uterus (mg)
Nil	5	0	Closed	26 2
Stilbœstrol	5	0 05	Closed	41 3
	5	0 1	"	68 8
	5	0 5	4 open	147 6
Hexœstrol	5	0 05	Closed	71 0
	5	0 1	"	77 0
	5	0 5	3 open	129 4

number of rats used was small, it is apparent that there was no great difference in the activities of the two synthetic œstrogens

Vaginal œstrus —Ovariectomised adult rats were used for assay purposes. The subcutaneous injections

were given twice daily for three days, and aqueous solutions were used throughout A positive œstrus vaginal smear was considered to be one composed exclusively of keratinised cells The animals received an active substance every two weeks One batch of 60 rats were used to compare the activity of stilbœstrol with œstrone and the hexadiene substance (4 4' dihydroxy-γ δ diphenyl β δ hexadiene) In

TABLE III—EFFECTS OF SUBCUTANEOUS INJECTIONS OF ŒSTROGENS ON VAGINAL ŒSTRUS

Substance	Total dose (μg)	Œstrus (per cent)	I U per g
Œstrone	0 6	26	10 × 10⁶
	0 7	59	
	0 8	80	
Hexadiene	0 3	30	20 × 10⁶
	0 4	94	
Stilbœstrol	0 3	27	23 × 10⁶
	0 25	47	
	0 3	56	
	0 35	90	
Hexœstrol	0·2	33	28 × 10⁶
	0 25	55	

another batch of 30 animals the activity of stilbœstrol and hexœstrol was determined The results and the calculated number of international units per g are listed in table III, which shows that hexœstrol is the most active substance, being 2 8 times more active than œstrone when assayed under the described conditions All three synthetic substances, however, are two to three times more potent than the naturally occurring œstrone

TABLE IV—EFFECTS OF ŒSTROGENS GIVEN BY MOUTH ON VAGINAL ŒSTRUS

Substance	No of rats	Total dose (μg)	Œstrus (per cent)
Hexadiene	5	1 0	20
	5	3 0	100
Hexœstrol	5	2 0	20
	5	3 0	100
Stilbœstrol	5	1·0	20
	5	3 0	100

The three synthetic œstrogens also have been administered by mouth to small groups of unstandardised ovariectomised rats The substances were dissolved in sesame oil and 1 c cm was given by stomach catheter once daily for three days The results are shown in table IV All three substances showed a high degree of activity after oral administration Œstrone tested under similar conditions was relatively inactive by mouth for a dose of 50 μg gave an œstrus response in 1 out of 5 rats and 75 μg a response in 2 out of 5 animals

Some preliminary experiments were conducted on the intravaginal application of synthetic œstrogens in ovariectomised rats These were given in two doses each of 0 01 c cm oil by a micro syringe, one in the evening and one on the following morning It was found that a total dose of stilbœstrol 0 004 μg per rat gave an œstrus smear in each of 5 rats A similar dose of hexadiene produced a positive smear in 5 out of 10 rats, and when hexœstrol was used 6 out of 10 rats showed an œstrus smear

SUMMARY

The synthetic œstrogenic substance 4 4'-dihydroxy-γ δ diphenyl-n-hexane has been found to sensitise the uterus of the ovariectomised rabbit to the action of progesterone and to stimulate the nipples and mammary glands Implantation in the rat was prevented by oral administration of the œstrogen Reduction of body growth and atrophy of the gonads followed its prolonged use in rats

The uterus of the immature rat was increased in weight by stilbœstrol and by hexœstrol, the changes produced indicating that the activities of the two substances were approximately equal

When assayed by injection into ovariectomised rats, hexœstrol was found to be more active than stilbœstrol, and both were two to three times more active than œstrone Stilbœstrol and hexœstrol showed approximately the same degree of activity when given by mouth and when applied intravaginally

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Clinical and Laboratory Notes

BILATERAL TUBERCULOUS EFFUSION

IN MILIARY TUBERCULOSIS OF LUNGS

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THE following case appears to be worthy of record in that a search of recent medical publications has not brought to light one of a similar nature

The patient, aged 26, a carpenter, died from an acute bilateral tuberculous effusion with a very recent miliary spread in the lungs secondary to the pleurisy He was seen by one of us (G H) in his home at the request of his doctor on Jan 17, 1939 There was no family history of tuberculosis, and the patient's health had been good until September, 1938, when he had an attack of influenza Since that time he had never really been well and had been definitely worse during December, 1938, and January, 1939, and from the beginning of the latter month he had been confined to bed When seen his chief complaints were of cough and dyspnœa He looked hectic and had been running an evening temperature about 101° F for the last three weeks Physical examination showed an extensive effusion in the right chest

On admission to the City Hospital for Infectious Diseases Newcastle on Tyne, on Jan 18, his general condition was good, apart from his hectic appearance Temperature 99 4° F pulse rate 120, and respiration rate 34 The right chest was dull throughout, with faint breath sounds and diminished vocal fremitus and resonance his heart being displaced 1 in to the left A radiogram of his chest showed, in the right hemithorax, a massive effusion, which on exploration proved to consist of clear straw coloured fluid

Two days after admission he became worse and was delirious for a short time His temperature began to swing, ranging from 98 4° F. in the mornings to 102° F. in the evenings. On the 26th the breath sounds in the left lung were found to have altered and become jerky. A radiogram of his chest showed that the effusion in the right side was clearing and a new effusion developing at the left base. On the 28th friction sounds were audible over the pericardial area, and on Feb. 1 a coarse pleural rub had developed anteriorly in the left chest. The condition of the right chest improved, the dullness decreasing in its upper half and the breath sounds becoming faintly audible over the same area.

For the next week the temperature continued to swing and became remittent, reaching 104° F. in the evenings, while the general condition slowly deteriorated. The patient, however, insisted that he was doing well and would soon be up and out of bed. On the 10th the right chest, on physical examination and on radiography, showed further clearing, the effusion being limited to the lower third; but the effusion in the left chest continued to increase The next day a blood-culture was taken which was negative. Pleuropericardial friction sounds were audible at that time and the respiration-rate increased to 44 The last radiogram, taken on the 15th, showed bilateral effusions, that on the left side being the larger. On the 17th both sides of the chest were explored, and clear straw-coloured fluid was obtained from each. The patient died on the 21st.

The fluid obtained from the right chest on Feb 7 contained lymphocytes but no tubercle bacilli. The fluids obtained from the right and left sides of the chest on Feb. 17 contained lymphocytes and tubercle bacilli. Sputum examinations throughout were negative for tubercle bacilli Scanty pneumococci were obtained from the sputum by mouse inoculation but did not react to any of the type sera.

On post-mortem examination the following naked-eye appearances were seen. When the sternum was raised the pericardium was seen to be thickened and surrounded by an organised exudate. The right pleural space was obliterated by thickened gelatinous exudate. The left pleural space contained an effusion with some gelatinous strands in it, and the left lung was partially collapsed.

On section no naked-eye evidence of tuberculosis was seen in either lung. The interlobar septum on the right side was thickened and contained one caseous nodule A smear made from this contained tubercle bacilli. There were some enlarged mediastinal glands, and a few scattered tubercles were seen in the spleen and liver.

Portions of these tissues were sent to the University of Durham pathological laboratory for examination, and the following is the report received from Prof. A. F. Bernard Shaw.—

(*a*) *Right lung.*—This consists of a piece of lung 3 0 by 2 0 cm., the pleura of which is thickened (0 4 cm.) by a white organising exudate. Microscopically this shows an organising tuberculous pleurisy. The underlying lung shows partial collapse, œdema, and some miliary foci of tuberculosis.

(*b*) *Left lung.*—This piece shows a similar appearance to (*a*), but the pleura is not so thickened. Microscopically there is organising tuberculous pleurisy with collapse and œdema of the lung, in which are recent miliary tubercles.

(*c*) *Splenic lymph-node.*—This is enlarged (1 0 cm.) and shows microscopically actively necrotising tubercles of allergic type.

In this material the pleuræ show the oldest lesions, while elsewhere the lesions are secondary and recent.

SUMMARY

A case is recorded in which a patient suffering from pleurisy with effusion on the right side developed a similar condition on the opposite side Both effusions were clearly shown on radiography. During the illness the original effusion was clearing up. The illness lasted eleven weeks. A terminal generalised miliary tuberculosis was discovered post mortem.

We are indebted to Dr. J. A. Charles, medical officer of health, Newcastle-on-Tyne, for permission to publish this case; and to Professor Bernard Shaw for permission to use his report.

INTUSSUSCEPTION DUE TO SARCOMA

BY A. GRAHAM APLEY, M.B. Lond.

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ATTENTION has been drawn in recent surgical reports to sarcoma of the intestine in children. The case recorded below presents certain curious features differing from the now well-recognised clinical and pathological description.

A sarcomatous mass growing from the gut wall into the lumen of the intestine is an obvious predisposing cause to intussusception; yet Speese (1914), who collected 74 cases of intestinal sarcoma, found it in only 14 Simpson-Smith's (1938) examination of the published reports of this condition in children revealed a 24 per cent. probability of intussusception, though only in about a third of these cases was the intussusception an early feature, it usually following the recognition of a palpable tumour by weeks or months.

The following are some of the well-established facts pertaining to the condition. Intussusception occurs in some 30 per cent. of small-gut tumours (Joyce 1934) but most of these are benign (Raiford 1934), being lipomata, adenomata, and the like The ileum is the commonest site for a sarcoma (68 per cent.), and only 8 per cent develop in the jejunum. There is a high incidence of secondary deposits, though a few cases have been recorded in which none was found. Clinically, the commonest features in order of frequency are a palpable abdominal mass, a decline in the general health of the patient, and persistent vomiting Several patients with recurrent intussusception due to a tumour underwent a number of operations before the true cause was discovered (Oughterson and Cheever 1929)

CASE-RECORD

The patient, a somewhat undernourished boy, aged 9, was admitted after having had colicky abdominal pain for five days. This had come in attacks lasting about ten minutes at a time, and, though nausea had been absent most of the time, there was vomiting on one occasion.

In bed he was rather fretful and looked ill, with a furred tongue, temperature 99° F. and a pulse-rate of 110. The abdomen was slightly tender all over, but especially so over McBurney's point, and the right lower rectus presented some guarding. There was no suspicion of distension, nor was there any palpable mass. Rectally he was a little tender on both sides and there was no blood on the examining finger.

A diagnosis of appendicitis was made, but at operation the appendix was found to be only slightly inflamed No other abnormality was seen or felt in the abdomen. His condition subsequently deteriorated, the pulse-rate and temperature rising, and some twelve hours later he voided copious greenish-brown vomit. On several occasions after this he vomited

in an effortless fashion, though he never complained of pain or became distended Despite continuous intravenous infusion because of his dehydration, his condition continued to deteriorate and he died twenty-six hours after operation

At necropsy two large dark-red polypi were found in his gut Each was about 1½ in in diameter and situated in the jejunum some 6 in and 12 in from the duodenojejunal flexure respectively The proximal of these formed the apex of an intussusception which, because of well-formed adhesions, was evidently old-standing Both tumours appeared to be about the same age, and the intervening gut looked normal No secondary deposits were found Microscopic section showed each of the growths to be a small round-cell lymphosarcoma

DISCUSSION

This case had several unusual features —

(1) It presented as an acute abdomen, though there were no clinical features to suggest an intus susception

(2) The intussusception was so situated that its recognition at operation was highly improbable

(3) It appears to be distinctly uncommon to find two such growths with no secondaries elsewhere, though the possibility must be borne in mind that the distal growth arose by implantation of cells from the proximal

I wish to thank Mr J W D Buttery for permission to publish this case and Dr I B Morris for assistance regarding its pathology

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MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SCIENTIFIC MEETINGS, JULY 26–28

SECTION OF PUBLIC HEALTH AND HYGIENE

Dr JAMES MACKINTOSH, chief medical officer to the Department of Health for Scotland, presided over a discussion on

Medicine and the State

Public health, he said, was more and more coming to be regarded as *social medicine* and Scotsmen had played a pioneer part in the development of this newer outlook The names of J D Russell and Ballantyne, and more recently Parlane Kinloch and Sir John Orr, came readily to mind

Dr ANDREW TOPPING (London) proclaimed himself at the outset an advocate of the salaried medical service A review of the present situation, both in medical education and practice, revealed much that was unsatisfactory He thought that a salaried service would appeal to the majority of practitioners The medical curriculum was criticised as devoting much time to non essentials, such as the watching of difficult and specialist operations, whereas far too little time was devoted to infant feeding, midwifery and other important parts of general practice The position of the general practitioner was highly unsatisfactory He had no hospital appointment was not free for postgraduate study, and had little time for *medical reading, general practice* was becoming instead of a high souled profession a rather unethical trade The wrong type of doctor was often more successful than his painstaking and conscientious neighbour Consultants and specialists too were in a false position financial assets were often more important than medical capabilities, success was problematical and not measured by ability Public-health and social services suffered likewise from many disadvantages Many local authorities were unable to provide the services they should, so that the scope of those working with them was limited The time had come to consider how best improvement could be obtained The medical profession was a thinking serious part of the human race, anxious for the welfare of the people It was most desirable, if not indeed essential, that doctors should have a feeling of security and be able to devote themselves unstintingly to their work There would obviously be difficulties in achieving an ideal service but it was absurd to regard them as insuperable The history of the many services already introduced showed what could be done He would like to see a careful selection of students in the first place, a modernised curriculum and a reduction of the expenses of medical education Every graduate should have a period in hospital and all should have salaries commensurate with age and knowledge The hospital should be the centre of the medical region, the organisation radiating out from it He did not believe that work would become slack under a salaried system, but rather the reverse Control of the service must be entirely non political *and should in his view be in the hands of medical men*

Dr W G BOOTH (Boston, Lincs) said that a new outlook on medicine had sprung from the great increase of scientific knowledge in the last century and from the education of the masses He believed that the growing awareness on the part of the working people of the growth of medical knowledge made them dissatisfied with the limitations of national health insurance An effort had been made to provide for the deficiencies by public-health measures, such as mother and child welfare acts Development had been on the public health side rather than in the practitioner service The difficulties associated with this development tended to stimulate the possessive and acquisitive instincts of the practitioners Under a controlled medical service the attitude would be different as the patient would be in relation to the state He reminded the meeting of Bernard Shaw's dictum that there is no greater danger to the public than a poor doctor Some form of state medical service was inevitable He considered that encroachment on the work of practitioners would have been even greater had not the medical officers of health restrained local authorities, and it was not likely to become less The general practitioner if he were wise would press for a state service as quickly as possible before encroachment wiped him out altogether While the British Medical Association was strong it should push forward with suggestions

Dr H J RAE (Aberdeen) spoke of the public health services in the north east of Scotland from the end of the late war to the present time He pointed out how the various amalgamations in the form of regional services had overcome the shortcomings inevitable in having too small areas of administration The ideal unit in relation to the provisions of the Local Government Act was one with a population of a quarter to half a million The Aberdeen region with its population of some 340 000 fell within these

limits. In the county there were divisional officers at the periphery, in the city there were medical specialists in bacteriology, fevers, tuberculosis, and venereal diseases. The services of these officers were whole-time and available throughout the areas. In much of the work general practitioners were closely associated, more in the country than in the city. In the counties a liaison committee consisting of representatives of the county division of the B.M.A. and public-health officers met periodically to discuss matters of interest.

Dr. E. R. C. WALKER (Aberdeen) said that efforts must be made to agree on basic principles. The Scottish committee of the B.M.A. some five years ago had arrived at the basic propositions that medicine is essentially the application of human biology and that the health of an individual at any time is the measure of his success in reacting to his environment. If the development of the state was considered also from the standpoint of evolutionary biology, it could be regarded as an instrument devised by man favourably to alter his environment. Since medicine was by definition the art and science of restoring and maintaining health, it followed that the function of medicine was inevitably a concern of the state. From these propositions it followed also that the basic provision must be a corps of men and women skilled as health advisers. The wisdom of preserving freedom of choice as far as possible seemed to follow on this conception. Looked at in this way medicine was essentially a service and not a business and as such would seem more fittingly remunerated by salary than by fee. The emoluments and conditions of the service should be such as to attract young men and women of high qualifications. Rise in the scale of salary should take place early; this would encourage early marriage and the raising of healthy families so that the doctor's precepts could be reinforced by example. The service should be a national one and on balance a regional organisation with corresponding ad-hoc administration seemed indicated.

Dr. WALTER ASTEN (Bournemouth) said that the idea of a state medical service had the unfortunate effect of retarding the improvements for which all were looking. The word "state" was a bogy, especially in the profession. What was wanted could never be obtained under the existing system. In spite of the provision of the Local Government Act only about half the public-health committees had succeeded in implementing the intention of the act to absorb and improve the poor-law medical services.

Dr. SAGGAR (Dundee) said that public-health machinery was needed to dispose of the causes of disease. The doctor was not only a medical but also a social and political unit. He did not believe that free choice of doctor was very important and pointed out that the absence of free choice in education was not seriously resented. A state medical service would be much less costly than the present arrangements and the work of the doctor under it would be better and less arduous.

Dr. LAURENCE KILROE (Rochdale) said that the general practitioner was painfully aware of his shortcomings; they were made clear to him from all sides. He was impressed with the possibilities of a salaried service and thought that on the whole competition did more harm than good. He agreed with Dr. Walker that in the present state of world affairs there was plenty of time to work out a good scheme. He emphasised the necessity for coöperation between the B.M.A. and other bodies in such work.

Dr. WICKREMESINGHE (Ceylon) commented on the unanimity of opinion so far at the meeting. In Ceylon they had a salaried service and he thought there were many disadvantages in a state service. A servant of the state had to go where he was sent and when he was sent. He favoured reducing the difficulties of private practice by throwing open medical centres for use by practitioners, thereby improving their service to the community.

Dr. TOPPING in his reply urged that more consideration should be given to the subject generally. Financial and other detailed arrangements should be worked at. He believed that a state service would be self-supporting in a few years by reason of the effect it would have in eliminating overlapping and in the improvement of health. He criticised the B.M.A. as seeming often to put the interests of the members before those of the community.

Dr. MACKINTOSH, summing up, said that constructive criticism was needed. He pointed out that the distinction between a salaried and a state service was not a fine one but a broad and deep one. There was a great difference between a state service as exemplified by a civil service and a salaried service such as the education service. In the latter there was freedom of the individual members to form associations for the promotion and protection of their interests and freedom from direct governmental control.

SECTION OF SURGERY

With Prof. J. R. LEARMONTH (Aberdeen) in the chair, this section discussed

Venous Varicosities

Prof. LAMBERT ROGERS (Cardiff) said there were three factors in the production of varicose veins. First there was a congenital element, for example, in varices of pial veins over the cortex. Secondly there was a congestive factor as in pregnancy. Lastly posture was a very definite cause. Varicocele was a transient condition of adolescence and did not require any operative treatment. Before any treatment was begun the patency of the deep veins must be ascertained. Ligation combined with injection was the method of choice in most cases. Pregnancy was an indication for conservative treatment. Recurrences after injection alone were high. It was important to perform any ligation high up on the saphenous vein above the entry of any tributaries. Small varices, especially in pregnancy, might be treated by injection alone, and large venous pouchings were better excised. As a sclerosing agent he used that described by Biegelseisen in 1937, monoethanolamine oleate (Ethamolin) in benzyl alcohol. There was less danger of perivenous irritation than with other substances. He concluded with a plea for more surgery in the treatment of varicose veins.

Mr. W. B. GABRIEL (London) said that, in the treatment of hæmorrhoids, it was important to decide whether they were external or internal, whether there were any other ano-rectal conditions present and the degree of prolapse. External hæmorrhoids were covered by skin. Examination of the anal canal might reveal a prolapsed hæmorrhoid or surface ulceration above the obvious lesion. Acute anal hæmatoma was treated by excision of the hæmatoma along with a pear-shaped piece of skin and any skin tag present. An internal pile was covered by rectal mucosa which might become epithelialised. There was always a groove between the anal skin and the

pile mass There were three stages of internal piles according to the degree of prolapse, and it was important to ask the patient to strain down as the speculum was being withdrawn to see the degree of prolapse Other ano rectal conditions must be excluded by complete proctoscopy and sigmoidoscopy Treatment was expectant, by injection or operative Overindulgence in aperients was a common cause of hæmorrhoids In inflammatory conditions expectant treatment, rest and eusol compresses gave good results Portal pyæmia was a very rare complication Injection was ideal in first-degree piles which did not extrude even on defæcation, but was of less value in more advanced forms It was important to make the injection with 5 per cent phenol in almond oil at the upper pole of the pile The patient ought not to feel pain during the injection Operative excision was recommended in the third degree of prolapse Low spinal or local anæsthesia was better than inhalation anæsthesia, as the relaxation of the sphincter was more complete The operation he preferred was that described by Milligan and Morgan The pile was pulled down and the muco cutaneous junction cut with scissors The subcutaneous sphincter was exposed, and also the longitudinal muscle The pile mass was ligated using No 3 chromic catgut after transfixion The pile was then excised No attempt was made to approximate the skin closely Recurrences were mostly due to incomplete excision or faulty technique

Mr E T C MILLIGAN (London) gave statistics of a large series of cases treated at St Mark's Hospital Injection was of most value in first degree hæmorrhoids It was less use in the other degrees, but patients preferred it as it did not interfere with their normal life He discussed local factors in the production of hæmorrhoids The longitudinal muscle of the bowel was the main factor in maintaining the pile in its normal position When it became stretched an irreversible change had taken place Secondary fixing structures were the elasticity of the anal mucosa and submucosa and the blood vessels themselves Sclerosing injections replaced the secondary structures only At operation all the abnormal structures were removed, so that recurrence was almost impossible Successful treatment gave amazing comfort and relief to the patient

Mr PHILIP TURNER (London) described the operation of excision of varicose veins as tedious, futile, and bloody The weak spot was the saphenous opening where stasis was encouraged by the three superficial tributaries entering in a downward direction and by the occasional pressure of an enlarged lymph gland At operation it was advisable to ligate all the tributaries and to remove the lymph-gland

Mr J B OLDHAM (Liverpool) suggested that it was useful, when combining injection with ligation, to pass a ureteric catheter down the vein and inject through it while it was being withdrawn The operation for varicocele was useless and ought not to be made obligatory before entering the Services

Mr N L WATERFIELD (London) advised stretching of the anal sphincter at operation to relieve post-operative pain

Mr H J MCCURRICH (London) spoke of the empty vein technique of injection With it good results were obtained without the formation of a hard tender cord immediately after injection

Mr G GORDON-TAYLOR (London) had found Trendelenburg's operation a very good one provided the saphenous vein was tied flush with the femoral vein He also agreed that operation for varicocele was unnecessary

Mr J H F JAYASURIYA (Ceylon) said that varicocele due to filariasis was common in Ceylon Veins were grossly dilated and lymphatics blocked Secondary streptococcal infection was common but yielded to sulphanilamide Operation was the best treatment for this condition

Prof LAMBERT ROGERS, in reply to a question, said that he used monoethanolamine oleate in doses of about 5 c cm He had not used the empty-vein technique, but thought that it seemed to be a good one

Mr W B GABRIEL thought that stretching of the anal sphincter depended on the anæsthetic used If it were tight after proper spinal or local anæsthesia it must have some fibrous contraction and must be stretched or divided in the middle line posteriorly. His operation was not followed by stricture It was important to examine the anal canal digitally on the seventh day, and again after a few weeks

Radiotherapy and Surgery for Cancer

With Mr G GORDON TAYLOR (London) in the chair, Mr RALSTON PATERSON (Manchester) said that malignant growths could be divided into three groups The first were curable or at least treatable The second responded to palliative radiotherapy and the third group were so far incurable Into the first group came malignant disease of uterus and vagina, skin, breast, and mouth and tongue These were easily diagnosed and could be successfully treated if attacked in the early stages Incurable malignant disease occurred in liver, pancreas and lung Here even palliative radiotherapy was useless Radiotherapy was contra indicated in cancers of the gastro-intestinal tract and connective tissue and osteogenetic sarcomata and more advanced malignant disease It was often difficult to persuade doctors that in these radiotherapy was unsuitable even as a palliative measure Radiotherapy had a limited value in carcinoma of the pharynx, bladder and prostate, œsophagus, lung and brain, but it occasionally relieved symptoms for months or even years. It was the treatment of choice in embryonal tumours, some tumours of the thyroid and salivary glands, and tumours of reticulo endothelial origin There were cases where radiotherapy could be helped by surgery, such as growths of the mouth, skin, bladder, cervix and antra Cases where surgery was the dominant treatment, and radiotherapy of value, were growths of the breast, lymph glands and body of uterus, and giant cell tumours of bone Sometimes borderline cases could be made operable by deep X rays, for example, mixed tumours of the parotid gland Early diagnosis and treatment of the curable cancers of the breast, mouth, uterus and skin were essential The public should be educated to recognise the early symptoms

Plastic Surgery and Facial Injuries

Mr A H MCINDOE (London) said that what the motor car did today war might do tomorrow Early treatment of facial injuries was most important and frequently prevented grave permanent disfigurement Injuries could be divided into those with no gross loss of substance and those with considerable tissue loss requiring some sort of graft later Treatment in the second type was palliative Abrasions with ingrained grit or powder should be treated by immediate removal of all the foreign material with

a sharp curette. Débridement was less important in the face than elsewhere thanks to the very profuse blood-supply. Heavy suture material should be avoided as the suture marks were very difficult to remove. Eyeless needles should be used. Fractures of the zygoma and nasal bones were extremely disfiguring and demanded immediate treatment He described an emergency splint for the upper jaw made from a dental impression tray and interdental wiring for fractures of the mandible. The treatment of gross compound injuries was palliative and no attempt to graft tissues should be made until the danger of sepsis had completely vanished.

Surgical Treatment of Hypertension

Prof. J R LEARMONTH introduced Dr W. McK. CRAIG (Mayo Clinic) who said that there were three factors in the maintenance of the blood-pressure—viscosity of the blood, propulsion, and peripheral resistance Of these only the third could be altered surgically. Recently hypertension had been artificially produced in animals by compression of the renal vessels In 85 per cent. of patients hypertension was primary; in the rest it was secondary to some other condition such as coarctation of aorta, chronic nephritis or suprarenal tumour. In primary or essential hypertension heredity was an important factor. Cold water and Pentothal sodium tests could be used to determine the upper and lower limits of the blood-pressure. Potassium thiocyanate treatment was useful especially after sympathectomy, but it was a very toxic drug, and must be used with extreme care. In 237 cases treated surgically there had been no operative mortality. Many cases which were now treated by operation might be treated medically within the next decade.

Mr. L. R BROSTER (London) thought that there was not enough coöperation between physicians and surgeons in dealing with cases of hypertension

Mr. J. B. OLDHAM (Liverpool), in his experience of adrenalectomies, had found that the blood-pressure rose again after a time Denervating the kidney did not make any difference to the blood-pressure.

Mr. NORMAN LAKE (London) had done sympathectomies for other reasons and found that the blood-pressure had risen after some years.

Dr. CRAIG described the operation of subdiaphragmatic sympathectomy in detail, and illustrated it with a short film in colour.

MORAL REARMAMENT

A RECEPTION was held in Aberdeen on July 22 by Sir John and Lady Orr and Dame Louise McIlroy at which Sir John Orr presented the following resolution:—

We, members of the British Medical Association, believing that many diseases and much physical and mental suffering are caused by morbid fears, worries and hatred, by bad housing, bad diet and anxiety due to poverty, and believing that moral rearmament will create a new spirit of justice, love and respect for the dignity of the common man which would lead to the abolition of these diseases, resolve to equip ourselves morally and spiritually and to give full support to all efforts to apply the resources of science to the building up of a new world in which men will be able to attain their fullest inherited capacity for physical, moral and spiritual development.

Evidence was given of moral rearmament applied to medical practice and a film was shown which illustrated the effect on youth of a new physical and moral fitness

Dr. E. E CLAXTON, of Folkestone, laid stress on the part the profession could play in the international sphere Medicine, he said, knows no national barriers, and our training in accurate diagnosis and treatment could be applied to the world's unrest as much as to disease The doctor, with his natural access to the homes of the nations, could in fact tackle these problems at their source.—Dr. DONALD COURT, registrar to the children's department of Westminster Hospital, showed how moral rearmament had produced a new kind of contact with the staff, the patient and the general practitioner, and enabled him to deal effectively with the nervous child —Dr. ALEXANDER MUIRHEAD, regional medical officer of health, gave instances of the new coöperation between both colleagues and rivals in Eastern Scotland which had resulted from moral rearmament, and Dr. MARY MACNICOL, of Edinburgh, spoke especially of its application to general practice — One of the guests, Mr. ROLAND WILSON, of Oriel College, Oxford, showed how moral rearmament was rapidly becoming a world force and exerting a constructive influence on national policy both in Europe and the Far East

A message has been addressed to American citizens at the World Assembly for Moral Rearmament at the Golden Gate Fair, San Francisco.

In the continuing uncertainty of world affairs, it says, medical practitioners in common with others are deeply concerned to restore the security essential to normal living. It is vital to create confidence during an emergency, but even more urgent to prevent catastrophe and to lay the foundation of a just and lasting peace. Science has made great advances, but without corresponding moral progress we risk losing even the benefits already achieved. Behind much disease as behind world unrest are fear, self-indulgence, jealousy and resentment. These are problems for which Medicine might provide a radical solution. It is still our privilege to enjoy unrivalled contact with the homes and people of the nation. Our immediate task is to teach men that health is not the mere absence of disease but includes a moral and spiritual foundation for life and the replacing of conflict and apathy with a purpose that claims the whole personality in the service of our fellows.

A growing body of people in many countries is calling for this "moral rearmament" to provide the discipline and the direction needed by both individual and nation. Our profession can give a lead to such a programme which is in accord with the highest ideals of our tradition. To achieve it we realise that the highest standards of honesty and unselfishness must be the touchstone of our professional and private lives Only through insistence on these spiritual values will the resources of science be liberated and a new world built in which men can attain to their inherited capacity for physical, moral and spiritual development.

This manifesto is signed by: Dr. G. C Anderson, Sir Thomas Barlow, F.R.S., Lady Barrett, Sir Henry Brackenbury, Dr. H. Guy Dain, Mr W. McAdam Eccles, Dr. Thomas Fraser, Prof. John Hay, Lord Horder, Prof. Geoffrey Jefferson, Prof. R W. Johnstone, Prof. John Kirk, Dr Colin Lindsay, Sir Ewen Maclean, Dame Louise McIlroy, Sir John Orr, F.R.S., Prof Leonard G Parsons, Dr. Donald Paterson, Prof Lambert Rogers, Sir Humphry Rolleston, Mr. Cecil P. G. Wakeley, Sir Beckwith Whitehouse, and Prof. Samson Wright.

REVIEWS AND NOTICES OF BOOKS

Royal Northern Operative Surgery

By the Surgical Staff of the Royal Northern Hospital London H K Lewis and Co 1939 Pp 551 42s

Like all multiple-author books the standard of writing and of the selection of matter for inclusion varies very much, but it can be said with confidence that the average is high The book is an attempt to describe one reliable operative procedure for each common surgical condition Rarely performed methods and those under trial are not in the main described This is one point we would select for special commendation The newly fledged surgeon is saved from the dilemma of choosing a suitable operation from a number of what may appear to him equally desirable and effective procedures

There are two sections which are particularly helpful and practical, those on affections of the rectum and on thoracic surgery Here the authors give easily followed directions for carrying out the operations they describe, but this cannot be said of all the contributions One suspects that mucoeiasis of the gall bladder described by Thorek is seldom performed at the Royal Northern Hospital The follow-up of gastric cases does not appear to have been done very carefully, since a simple separation of the jejunum from the stomach for gastrojejunal ulcer finds a place in the treatment of this serious complication of gastrojejunostomy for duodenal ulcer The operation of partial gastro duodenectomy, which for years has now been established as a more reliable operation than gastrojejunostomy, is not even mentioned In the chapter on kidney operations there is an excellent description of subscapular nephrectomy—in Swift Joly's own words It is questionable whether resection of the pelvis in hydronephrosis operations is generally desirable A surgeon seeking for information about auricular fibrillation after a thyroidectomy will meet with a disappointment for he is told, in all simplicity, that "a physician should be summoned" There is a curious omission of the name of R E Norrish in the list of contributors on one of the front pages, yet in the preface he is thanked for invaluable assistance and for his own contributions

Apart from a few such criticisms there can be nothing but praise for this new book Particularly will it be helpful to surgeons early on in their career The methods described are practical, sound and reliable Operative instructions are clear and the illustrations very good

Angina Pectoris

Nerve Pathways, Physiology, Symptomatology, and Treatment By Hermann R Miller, M.D, attending physician, Sydenham Hospital, associate attending physician, Montefiore Hospital, New York City London Baillière, Tindall and Cox 1939 Pp 276 15s

Dr Miller has approached angina pectoris from an anatomical rather than from a physiological point of view, for his chief interest lies in the nervous pathways by which cardiac pain is transmitted The justification for this interest lies in the success of attempts made to relieve angina pectoris by surgical interruption of the afferent nerves from the heart The book contains 31 valuable charts illustrating the complicated anatomy of cardiac innervation, and also a useful discussion of the various surgical manœuvres which have been employed in the treatment of angina pectoris But the stressing of the importance of the nervous pathways has resulted in the comparative neglect of the factors fundamentally responsible for the pain The consideration of the actual cause of cardiac pain occupies but two and a half pages of the book, and acute myocardial infarction is hardly distinguished from an attack of angina pectoris This anatomical bias, however, is a corrective for those who regard angina pectoris as a question of muscle ischæmia and hypothetical "P" factors The book ends with an attempt to study individual experiences of pain and reactions to it, a problem which must occupy anyone who has seen unbearably painful cardiac infarction in one case and the same thing apparently painless in another

Civilization, War, and Death

Selections from three works by Sigmund Freud Edited by John Rickman, M.D Camb London Hogarth Press, and Institute of Psycho Analysis 1939 Pp. 102 3s 6d

The publication of these selections at the present time is peculiarly appropriate The book shows Freud as an essayist rather than as a psychologist, and, as the original works were intended for the layman, the extracts can be read by those who have no special knowledge of medical psychology There is much in them which reveals the profound thinker and humanitarian, with a mind aloof from nationalism Freud presents the motives of mankind as he sees them without emotion Dr Rickman's choice of selections shows that he has a deep knowledge of the work and a sincere regard for the writer, and he is to be congratulated on the skill with which the choice is made The original German has been translated into readable, literary English

Physiology of Exercise

(3rd ed) By James Huff McCurdy, A.M, M.D, M.P.E, director of physical education course in Springfield College, Massachusetts, 1895–1905, and Leonard A Larson, B.A, B.P.E, M.Ed, Ph.D, professor of health and physical education at the college London: Henry Kimpton 1939 Pp 310 17s

It must be a source of mystification to our American colleagues that there is nothing analogous to their organisation for the scientific study of athletics in this sport loving country In the United States the universities and other centres of education maintain their professorial chairs and their directorships of physical education with faculties, degrees and diplomas Here, on the other hand, any investigations are left to a few voluntary enthusiasts And yet we are entitled to claim contributions to the subject of the physiology of exercise which are far from insignificant The late Professor Bainbridge, for example may justly be regarded as having established fundamentals which will stand for all time

With subsidised research, a large body of workers, and unlimited material, it is not surprising that an immense literary output is forthcoming from the United States, and an outstanding feature of this book is the number of references to American work Its full bibliography is perhaps its chief recommendation, for, after the interesting introductory chapters, much of the material set out will be of little value except to the research worker The jerky staccato style

makes study difficult. Nor is a sense of proportion maintained. Thus eleven tests for cardiovascular function are fully described, not one of which has any advantage over the simple observation of the effect of change of posture on the cardiac rate and blood-pressure (mentioned in Sir Adolphe Abrahams's paper on p. 309 of this issue), and twenty pages are devoted to figures dealing with "organic efficiency tests," whereas "stitch," which is of the greatest interest to many athletes, is dismissed in nine words, in an explanation which is almost certainly incorrect. An oxygen debt of roughly 3½ litres per minute is said to have been incurred during a four-mile boat race. This would mean a total oxygen debt of over 70 litres, whereas A. V. Hill has shown that the maximum debt ever estimated in a very exceptional subject was about 20 litres Such statements show a lack of critical scrutiny which is both surprising and disappointing in such authorities.

Protein Metabolism in the Plant

By ALBERT CHARLES CHIBNALL, Sc.D. Camb., F.R.S, professor of biochemistry, Imperial College of Science and Technology, London. London: Humphrey Milford, Oxford University Press. 1939. Pp. 306. 18s.

THIS book, which is the twenty-seventh volume in the series published by the Silliman foundation, maintains the high standard set by previous writers Professor Chibnall has divided his subject in a natural manner into the protein metabolism of the seedling, and that of the leaf After a historical review of the earlier researches, he emphasises the effect on the course of protein synthesis according to the form of nitrogen provided In dealing with the leaf, he describes the reactions involved in his ether-water method of isolation This method has revolutionised the chemistry of leaf proteins, and is an example of the truth that advances in science depend upon the evolution of new methods. In dealing with leaf-protein metabolism the author has allowed himself a certain latitude and may not find other workers in this field agreeing with him. He includes also a discussion on the reason for the difficulties encountered in isolating proteins from the leaves of pasture plants His description of the course of protein metabolism in the leaf, including as it does data obtained from detached leaves as well as those kept in the dark, is highly stimulating The labile character of the proteins of leaves is well known, and the chapter on the regulation of the metabolism in the leaf provides much food for thought

The value of the book is enhanced because the author, while using his skill as a chemist, has considered his material as living material The book should therefore appeal to all biologists and especially to the physiologist

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Endocrinology in Modern Practice

(2nd ed) By WILLIAM WOLF, M.D, M.S, Ph D., endocrinologist to the French Hospital; attending endocrinologist to the Misericordia Hospital, New York City. London: W. B. Saunders Company. 1939. Pp. 1077. 45s.

IN this book the author has successfully compressed the vast and diverse information available on the endocrine glands, and has produced what is perhaps the best general textbook on the subject in the English language Thanks to rapid experimental advance, large sections of a book on endocrinology may be out of date in as short a time as a year. So in this second edition extensive revision has been necessary. Among the new subjects are sections on zinc-protamine insulin, the hypoglycæmic states, and endometrial suction biopsies. Perhaps owing to the peculiarity of examinations the student is well acquainted with the rarer disease syndromes of the anterior pituitary or the adrenals, but knowledge of obesity, the menopause, sterility and menstrual disorders is often very slender. Dr. Wolf gives these important practical problems the space they deserve.

The book has one serious omission; in all its 1077 pages there is not a single reference to the literature Inevitably this leads to dogmatism on controversial matters, so that in places it is difficult not to disagree fundamentally with the author. It is not suggested that a complete bibliography should be presented in a volume of this sort, but a critical selection of the more important papers would have been of great value, and might well have replaced the rather useless summaries at the end of each chapter or the 33 pages devoted to symptom diagnosis.

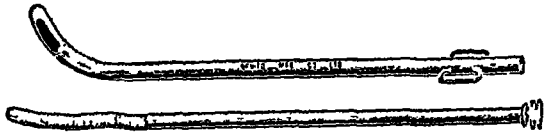
As the title implies, this book is written mainly for the practitioner, but it will appeal also to the student wanting a general introduction to endocrinology For either audience, however, it seems a mistake not to put all sides of the question at a time when the therapeutic application of endocrine preparations is fraught as much with danger as with advantage.

NEW INVENTIONS

A CLOT-EVACUATING CATHETER

FOR severe cases of clot-retention the Bigelow evacuator is of unquestionable utility The technique of this generally requires the operating-theatre and a general or spinal anæsthetic

I have used the instrument here illustrated long enough to have proved its value It was made to my design many years ago by the Genito Urinary Manufacturing Company Essentially it is a catheter which can easily be passed after Novocain has been injected into the urethra and is made in two sizes, 24 Ch and 27 Ch It has two very large laterally placed windows (22×6 mm). A flexible lobster-tail



obturator, which fits snugly but not tightly, closes the windows and allows introduction without trauma The most important function of the obturator is to act as a suction piston, for on sharp withdrawal solid clots can be evacuated in rather a remarkable and unexpected way. Perseverance in this, with occasional introduction of an ounce or two, gradually increasing as the bladder becomes freed of clots, of a 1 in 10,000 solution of nitrate of silver with a Thomson-Walker syringe, will eventually clear the bladder completely. A preliminary injection of morphine will increase tolerance, and no further anæsthesia other than novocain locally is required. The whole performance can easily be carried out in the patient's bed

Many a time I have cleared a bladder distended to the umbilicus with apparently almost solid clot, with far less constitutional disturbance than that associated with the requirements of the Bigelow's evacuator; it is also much simpler.

JOHN EVERIDGE, F.R.C.S.

THE LANCET

LONDON SATURDAY, AUGUST 5, 1939

THE MESS OF MEDICAL LITERATURE

In a recent book H G WELLS tells of an amazing man who attempted to tidy up the mess of fundamental thought throughout the ages His hero, William Burroughs Steele, gave his life to the exposure of "habitual piecemeal thinking" and being frustrated took an overdose of sedative, leaving as his dying message the words "We make a pattern better than we know Keep on with it" It is a story that may well haunt the student of medicine who is perpetually frustrated, in his urge to fit his own work into a general scheme of knowledge, by the mess of medical literature A lively correspondence in our own columns was opened by Professor McDOWALL with the statement that the present state of medical literature is chaotic to a degree that leads young and enthusiastic investigators to waste their energies on doing work which would be unnecessary but for lack of coördination in presenting the work of others He was the more entitled to say this, having himself made a brave attempt to provide [1] a sign-post to one section of medical knowledge—the physiology of the circulation The various librarians who have taken up his challenge agree in the urgency of the difficulties if not in the method of their solution, and it may be the time has come to consider possible solutions of a problem which faces writers and librarians and readers alike The problem itself was stated in a leading article not long ago [2]

A beginning might be made in three directions (1) some measure of control over the volume of medical periodical literature, (2) an effort to ensure complete indexing of the contents of medical periodicals and books, (3) cooperation between abstracting journals to secure completeness without overlapping Whenever an author is following up work already published Sir WILLIAM BRAGG has suggested it would generally be enough to print a summary instead of a full dress article, provided that a type-written or photostatic copy (or even a microphotographic film) is available for other workers in the same field who alone require the details Reduction in the number of circulating periodicals would require an international convention with the power to eliminate and to act as a court of reference on the need for a new periodical Utopian though it may appear this would be the rational method of reducing the volume of scientific literature, and the time is approaching when an attempt along these lines must be made Without waiting for this time someone should get on with an indexing journal of medical science and practice which would list all periodical literature and notice all new books published At the present time we are indebted to the United States for the two great indexes the Quarterly Cumulative Index Medicus and the *Index Catalogue of the Surgeon General's library*. But the Index Medicus does not include all existing medical periodicals nor the titles of all the articles in the indexed periodicals The Index Catalogue is even less complete, invaluable as it is for early records If the Index Medicus is to continue as our main reference to scientific literature, there should be international coöperation to ensure its completeness, with a subsidy from every country proportional to the number of titles listed from its journals

The third part of the problem is more difficult The cost of abstract-journals is high, a complete set would cost a library at least £300 a year Actually there is much overlapping and the complete medical field is not covered Eleven of the abstract-journals dealing with clinical medicine are due to the enterprise of one German publisher and their total cost is slightly more than half of the cost of all the abstract-journals published in the world Here is an equally clear case for international coöperation, without it the investigator cannot hope to find the abstracts within a reasonable time of publication But even if the investigator had a complete indexing tool and a complete range of abstract journals at his disposal, he would still need a specialised directory, on the lines of the general "Subject Index to Periodicals," to tell him where each of the periodicals he wishes to consult is to be found Each country should possess a complete collection of all medical periodical literature or, if not a complete set, an arrangement whereby some photographic reproduction of the article in the missing journal can be secured, and no country in the world at the present day has such a set In Great Britain no existing library could afford to take on the task The universities and research section of the Library Association is however attempting to compile a directory of what is available here and there in the United Kingdom This is an extension of what was begun by Professor LEIPER fifteen years ago, but unless the necessary funds are forthcoming soon the project must fail In London, as has been noted in the correspondence, four medical libraries have agreed to a common policy in order to reduce duplication and to pool their resources for the benefit of investigators in the four institutes We may hope before long to have a list of the periodicals available in these four libraries, other London libraries will then no doubt enter the common pool. The critical factor is the poverty of medical libraries For half a century the burden on their staffs and budgets has been piling up Small staffs and small budgets lead to inefficiency and waste The medical library is as essential a tool in the advancement of medical knowledge as is the research laboratory In a sense it is the master key. To clear up the mess of medical literature two things are needed—the pioneering spirit and a reckless buccaneer factor

1 *Lancet* 1939 i 825
2 *Ibid* p 765

YOUNG ADULT PHTHISIS

DURING the present century young adults have not shared in the general decline of the death-rate from respiratory tuberculosis This disquieting exception, noticeable especially among young women, has attracted much attention, but without as yet any satisfactory determination of the factors responsible—though the features of modern life incriminated have been numerous. In the last few years the reports of the Registrar-General for England and Wales have shown a distinct turn for the better. For young adult males the renewed decline in their phthisis mortality has been such that in a few years the death-rate may be as low as if no set-back had taken place in the war and post-war years Young adult females also show a material fall in mortality since 1931, but their death-rate is still considerably higher than it would have been if the trend of the latter half of the nineteenth century had been continued. Compared with the males the set-back in their rate of mortality was much more severe and, it is important to realise, certainly took place before the war. Between the decades 1871–80 and 1891–1900 the recorded death-rate from phthisis for females at ages 15–24 years was halved; between 1901 and 1931 it showed scarcely any improvement at all; in the war and post-war years there was a considerable rise. Even if the present more favourable trend should be continued, it is clearly of interest and importance to elucidate the causes of the previous set-back, for which the exceptional conditions of the war years cannot be held wholly responsible. Obviously no simple solution is likely; many factors may well have played a part and the difficulty lies in determining their relative importance This is the particular merit of the statistical study made by Dr. D'ARCY HART and Professor PAYLING WRIGHT,[1] now published with a commendatory note by Sir ARTHUR MACNALTY. Their work has developed along two lines. Taking England and Wales as a whole they have first set the mortality experience of the two sexes at various ages against the measurable changes in social conditions which have occured in the last 90 years. Secondly they have made a more intensive examination of the differences in mortality, particularly in that of young women, experienced between one urban aggregate and another during the past quarter of a century.

Under the first heading they have examined the trend of phthisis mortality at different ages, between the years 1850 and 1936, in relation to the course of real earnings They show that the mortality curve for young women matched the latter curve most closely, while that for young men came next. From this they conclude that young adults and especially young women may be particularly sensitive to changes in the standard of living and suggest that this may be the effect of combined environmental and biological causes —"the stress and strain of industrial occupation during the important formative period of adolescence and early adult life." Lack of comparative data prevents them bringing the standard of housing into the picture before 1891, but they note that the check to the rise in the standard of living that occurred in about the year 1900 was accompanied by a set-back in the improvement in general housing conditions. At much the same date there was an accentuated increase in the industrial employment of young women. A better examination of the possible importance of these factors lies in their second line of inquiry—into local differences in mortality and environment. For this purpose Hart and Wright have investigated the experiences of the county and metropolitan boroughs. It has been pointed out by previous workers that such local differences may in part be due to the selective migration of young adults; for example in the north of England the death-rates of the towns might be artificially raised by a reduction in recent years of a physically fit immigrating population and an additional loss of the more healthy members of the population by their emigration in search of work. Such effects would obviously weaken the comparison between recorded death-rates and environmental conditions.

From various statistical tests the authors, however, are satisfied that migration could not fully account for local differences in mortality, and that between 1921 and 1931 it can have played relatively little part in producing the very considerable differences in mortality shown by the English county boroughs. Such differences are found to be related, as might be expected, to general measures of poverty, and subdivision of those measures puts most weight on the prevalence of inferior housing, implying differences in closeness of personal contact. The special effects of housing on young adult females are suggested by the following percentage changes in phthisis mortality between 1911 and 1931: females, all ages, best housed towns, decrease of 34 per cent., worst housed towns, decrease of 26–30 per cent.; females aged 15–24, best housed towns, decrease of 22 per cent, worst housed towns, increase of 10–14 per cent. The influence of housing conditions on the improvement in phthisis mortality of young adults is further shown in the finding that in two groups of badly housed towns one had shown over 40 years a distinctly greater rate of improvement in its housing and a concurrently greater decline in its phthisis mortality at ages 15–24 than had the other. The authors, therefore, conclude that differences in housing conditions from one locality to another are a very important factor in producing the differences both in the present levels and in the recent changes in phthisis mortality among young adults in the English county boroughs In London this association with housing is very slight but it is probable that the housing index of a metropolitan borough is not an adequate measure of closeness of contact for an age-group, many of the members of which spend a large part of the working day elsewhere. Published data derived from the special surveys

1 Tuberculosis and Social Conditions in England: with special reference to young adults A statistical study by P D'Arcy Hart, M D, F R C P, and G Payling Wright, D M, M R C P London: National Association for the Prevention of Tuberculosis Pp 165 3s

of poverty and social conditions in London made it possible, on the other hand, to relate the phthisis death-rates of its areas to such other components of the standard of living The information suggests that other factors in poverty, such as inadequate nutrition, are also influential On the whole, however, Hart and Wright incline to the view that a working man with an increase in income would better guard his family against phthisis by spending the extra on improving their housing rather than on their food At the same time they are careful to point out that no single cause will explain the present incidence and previous retardation in decline of phthisis mortality in young adults There is undoubtedly a complex interaction of a number of factors, though amongst them Hart and Wright are not inclined to place the alleged decreased tuberculisation in childhood with a resulting reduced immunity in adolescence

Put very briefly their general conclusions may be stated thus At about the turn of the century the lack of improvement in the standard of living, and in housing, and the increase in the industrial employment of young women had a deleterious and selective effect upon the phthisis mortality of young adults, the sharp deterioration in the standard of living, and the food shortage, of the war years converted the already slackened rate of decline into an actual increase, these unfavourable reactions were unevenly distributed and can be shown to have been especially severe where social conditions, and most particularly housing, were poor

THE DEBT OF SURGERY TO THE MAYOS

IN the artists' room of the Mayo Clinic there is a skeleton At first sight it seems a commonplace object, an artist's model, but, if one knows its history, it expresses something of the romance which centres round the "Medical Mecca of Minnesota" The skeleton is that of an Indian chief who took part in an attack on Rochester at the time when the father of WILLIAM and CHARLES MAYO was the doctor of the little town The doctor's portrait is there too—a sturdy bearded figure driving in his buggy through the shack-lined street of a typical settlement of the Middle West How great is the change today! Rochester is a town given over to the pursuit of medicine Great buildings house its clinics and accommodate its patients, great halls provide the auditorium for lectures and graduations, there are experimental farms and magnificent laboratories, and in all these are men and women, gathered from many lands, paying a tribute by their presence to this American creation

But the MAYOS did something more than create a great medical centre, they laid down a principle Disease may have its beginning as a single and individual thing, but it soon has repercussions, and today all agree that the ideal estimate of serious illness should imply a review of all systems —a collective study centring on the local error This conception did not originate with the MAYOS but it was they who first established the organisation needed to act on it consistently And they did more, for they brought its benefits within the reach of all, whatever their status and position. By applying the rule of payment according to means they maintained their patient's independence while ensuring the economic success of their experiment, and the plan was one that commended itself to their individualist and democratic fellow citizens On the professional side an essential element in their progress was their ability to pick out, and attract, young men of promise and distinction, and in so doing they built up a team and a succession of teams that have maintained the standard first set Today the surgical world has many leaders who owe their training and their efficiency to the lessons learnt in the Mayo Clinic, thanks in part to the system of fellowships and scholarships established there by the characteristic generosity of the founders

Of their individual contributions to surgery it is difficult to write Their motto might well be *ubique*, for at one time or another they influenced and advanced a great variety of surgical conditions and procedures The name of W J MAYO will always be associated with the surgery of duodenal ulcer With the late Lord MOYNIHAN he may be said to have crystallised current knowledge of this condition and to have put its surgery on a sound and reasonable basis, in the same way his work on diverticulitis will be remembered as a model of clinical accuracy and scientific reasoning CHARLES MAYO's name is attached particularly perhaps to the surgery of the thyroid gland, which he popularised in the United States; but among such a plethora of contributions it seems futile to discriminate there seems no end to the record, and to get an idea of the versatility of these two men it is only necessary to turn over the pages of such a book as Binney's "Operative Surgery" The real debt of surgery to the MAYOS, however, is not so much in advances of technique or clinical observation as in something bigger In matters surgical they made the wilderness blossom as a rose, and they have left behind them high ideals, sound principles, useful methods, and a body of men enlivened by their courage

NEW WHITE CITY

LONDON'S biggest landlord the L C C, has launched a project worthy of socialist Vienna On the site of the old White City exhibition a new town of homes for more than 10,000 people is taking shape In 1935 the council decided to acquire the site for housing purposes Of the 62 acres, 45 have been set aside for flats, in all 2166 flats in five story blocks are contemplated One year ago construction began On July 21 the Minister of Health opened the first section—1193 flats, with 3910 rooms, for 5800 people Accommodation varies from one to five rooms The larger flats have their own sun balconies and fitted kitchens connecting with the living rooms by sliding doors Gas water heaters gas cookers and gas-ignited coke grates are installed Rents will range from 6s 6d (exclusive of rates and water charges) for a one room flat including kitchen recess bathroom and lavatory, to 17s 6d for a five room flat As an integral part of the scheme there will be schools and playgrounds, a clinic and a doctor's house, churches, an inn shops, a community centre, an administration building and reading rooms

ANNOTATIONS

A WOMAN FOR THE G.M.C ?

"JUSTICE," said Lord Darling, "is, like the Ritz, *open to all*"; and membership of the General Medical Council is open to women. Indeed one woman was elected to it some years ago as a direct representative of medical practitioners in England and Wales, though she died before taking her seat As was pointed out at the B M A meeting in Aberdeen last week, any electing body can choose a woman, and if a woman is wanted the machinery for her election is fully available. No doubt that will satisfy the formalists; but in actual fact the immediate chances of a woman being elected to succeed Christine Murrell on the G M C. are little better than those of a woman succeeding Elizabeth Blackwell as a student of St. Bartholomew's Hospital. The B M A. was assured by several representatives, including the only woman speaker, Miss Beatrice Turner, that females desire no more than equality of opportunity, which (it was said) they already possess How far this self-mortification is really prevalent among women doctors we do not pretend to judge, but we are not enamoured of machinery that does not work, and to any practical person interested in making the G M C more representative it must seem an anomaly that in a profession with 6000 women members (out of 60,000) there should not be a single woman in the council of 39 which directs its education and discipline. All questions of administration and politics concern women as much as men; they are equally interested in the welfare of the community; and there is no doubt that their judgment and experience would be of value in the penal and disciplinary work of the council Women are often called as witnesses; many of the complaints may be against women; and in all the really difficult cases women are concerned in one way or another Of the existing council 27 are nominees of licensing bodies, which are unlikely to put in a woman, however eminent, as their only representative, and 7 are elected as direct representatives of practitioners in the several parts of the United Kingdom. Dr. Murrell was herself chosen as one of these representatives · before her election she had been a member for fifteen years of the metropolitan branch council of the B M A. and had presided over it; for eight years she had been a member of the B M A. council and she had served on fifteen of its committees and subcommittees Her record of public work was outstanding and it may well be beyond the compass of later candidates At all events the B M A. meeting, despite a motion that one of the nominees of the association should be a woman, decided at Aberdeen on male candidates, Mr. Bishop Harman and Dr. E A. Gregg, for nomination to vacancies in the near future for direct representatives There remains the fact that the Privy Council has the disposition of 5 seats, which it allots to supply the council with members from branches of the medical profession not otherwise represented there. It was the Privy Council which, in response to parliamentary pressure, and very wisely, appointed a lay member of the council, and we hope it will take the next suitable opportunity to fill this other conspicuous gap

OCCUPATIONAL THERAPY

THE latest addition to the facilities for occupational therapy in Bristol is the Allendale Curative Workshop where equipment has been installed for treating patients, both "hospital" and private, at all stages of physical disabilities caused by accident or disease. The workshop, which is under the care of the staff of the Dorset House school of occupational therapy, will ultimately be developed into a full-time rehabilitation centre and a number of patients from the local fracture clinics have already passed through it. Last year Dr. Elizabeth Casson (*Med Pr.* 1938, 197, 265) outlined the work that has been done in this field for patients suffering from nervous disorders at Dorset House, for cases of rheumatic heart-disease and other medical conditions at Bristol General Hospital and Southmead, for cases of pulmonary tuberculosis at Ham Green, and for orthopædic cases at Bath Orthopædic Hospital She laid down four principles on which the use of occupational therapy is based First, it must be prescribed by the patient's medical practitioner in categorical terms Secondly, the prescription must take due regard both of the individual patient's mental and physical make-up and of the nature and extent of his disability. Thirdly, it must be carried out by a specially trained therapist who has the necessary knowledge of anatomy, physiology and psychology, and a wide experience of crafts and occupations Fourthly, it must be sufficiently engrossing to direct the patient's attention away from his disability. Dr. Casson urged that, apart from its use in hospitals and institutions, there is a wide opening for occupational therapy among private cases, where it can be provided by the hour in the patient's own home, in the same way that massage is given.

CONSTRICTIVE PERICARDITIS

FOUR years ago a paper by White[1] in these pages excited considerable interest in the syndrome of chronic constrictive pericarditis, and since then a number of operations have been performed for the relief of an otherwise incurable cardiac disability. The publication by Heuer and Stewart[2] of seven consecutive and successful operations of this kind merits attention because it brings out several new points in both diagnosis and treatment. The improvement they describe and illustrate by photographs is so striking that their paper should also help to remind the practitioner of the existence of the syndrome and the necessity of taking it into account in all cases of persistent ascites The presence of a pericardial scar should always be suspected where there is ascites and enlargement of the liver in the absence of the commoner causes of congestive heart failure The diagnosis is established by direct measurement of the venous pressure, which is always increased, and by a series of other findings, which include a pulse that is small in volume and an electrocardiogram of low voltage. The radiograms show a cardiac silhouette that is either smaller than normal or at the most moderately enlarged, and in some cases deposits of calcium may be clearly seen especially in the lateral view. Under the fluoroscope it may sometimes be observed that contraction of the several chambers of the heart is much diminished. In the cases recorded by Heuer and Stewart careful medical treatment preceded operation, the measures employed including complete rest in bed on a diet low in salt-content but with a high protein component Paracentesis of the ascitic fluid was also carried out, and free fluid

1 White, P D., *Lancet*, 1935, 2, 539
2 Heuer, G J., and Stewart, H. J., *Surg Gynec Obstet.* 1939, 68, 929

in the tissue spaces was eliminated as far as possible by giving Mercupurin intravenously The operations were done under oxygen and ether by the intratracheal method, so that positive pressure was available in the event of laceration of the left pleural reflexion The pericardium was exposed by resection of the second to the fifth costal cartilages together with short segments of the corresponding ribs on the left side, and it is Heuer's practice to preserve the perichondrium and periosteum He finds it possible after freeing the pleura from the left surface of the pericardium to obtain access to the right surface of the heart by depressing the heart so that there is a space between it and the sternum The pericardium is incised over the left ventricle This chamber is freed and then the dissection is carried out over the right ventricle No attempt is made to free the pericardium above the level of the auriculo ventricular sulcus The wound is closed without drainage Several interesting facts emerge from the detailed case histories In one instance microscopical examination showed that operation had been done for a tuberculous pericarditis, yet contrary to general experience the patient was cured In another patient improvement was gradual and the cardiovascular derangement did not completely disappear for a year but more usually the effects of the operation were immediate This is one of the few procedures, either medical or surgical, capable of transforming a bedridden patient into a man fit to engage in vigorous athletics

NERVOUS COMPLICATIONS OF SULPHONAMIDE THERAPY

ADVANCES in chemotherapy seem inevitably to be followed by a tale of sporadic mishaps and the sulphonamides have not enjoyed exemption in this respect A variety of complications have been reported ranging from blood changes, such as sulphæmoglobinæmia, acidosis, anæmia and leucopenia, to skin rashes of different kinds with or without features suggestive of serum sickness and these have lately been reviewed by Holman and Duff[1] Their comment that the nervous system in man is in general little affected by these drugs is undoubtedly correct, but Dr J H Fisher and Dr J R Gilmour show in their paper on p 301 of this issue that the central nervous system is not immune Their fatal case is of considerable pathological interest in that the spinal cord, which alone was affected, showed changes that have previously been described after antirabic treatment and spinal anæsthesia and in encephalomyelitis following smallpox Perivascular areas of demyelination were a conspicuous feature That these were secondary to vascular damage is strongly suggested by the necrosis and inflammatory infiltration of certain of the thrombosed vessels The massive softening of the lumbar enlargement is thus explicable as an infarct and the term myelomalacia is a suitable term for this condition rather than myelitis, which implies a primary inflammation

Why such a pathological sequence should crop up as a rare complication of some disease or form of therapy it is difficult to understand, in attributing it to idiosyncrasy we advance no further It has been argued that such reactions are allergic While this explanation does not cover all the observed facts in the reported cases it may reasonably be advanced in connexion with Fisher's two patients In these symptoms of nervous complications arose 14 and 6 days respectively after the administration of sulphonamide was begun, a period at which an antigen antibody reaction might be anticipated The possibility that the sulphonamides may have some antigenic effect can hardly be doubted in view of the demonstrations by Landsteiner and his co-workers of such properties in organic compounds of relatively simple composition notably the arsphenamines The pathogenesis of the encephalomyelitis that may complicate vaccination, smallpox and measles has never been satisfactorily elucidated Efforts to demonstrate virus activity by transmission experiments have failed and have failed once more in Fisher's first case The possibility that all these conditions are dependent on sensitisation has been suggested on clinical grounds and deserves further consideration

1 Holman W L and Duff G I *Amer J med Sci* 1939, 195 379

JOHNS HOPKINS JUBILEE

IN May, 1889, the Johns Hopkins Hospital was opened and fifty years later its famous Bulletin[1] has reprinted the addresses given at the opening by the three men who translated Hopkins's ideas into fact Johns Hopkins, as Francis King, John Billings and Daniel Gilman told their audience, wished that his hospital should compare favourably with any in his own country or Europe He was careful to leave his trustees almost entire freedom in their methods and designs In two things only he anticipated their decisions, he provided a splendid site and willed that his hospital and medical school should constitute the medical department of his university The board of trustees were worthy of his confidence As we look back on this half-century and read in their own words the hopes and aims which inspired them there rise again to our minds the old familiar phrases—"Wisdom hath builded her house, she hath hewn out the seven pillars through wisdom is an house builded, and by understanding it is established, and by knowledge shall the chambers be filled with all precious and pleasant riches" The fame of Johns Hopkins has gone out into all lands, and the aims and inspiration of the founder and his trustees have proved a beneficent stimulus to medicine throughout the civilised world Johns Hopkins dreamed a dream, as did Rahere in an earlier century, and his dream has been translated to the great hospital which, like Milton's eagle, now "mews his mighty youth"

1 *Bull Johns Hopk Hosp* 1939, 65 3

BILATERAL PLEURAL EFFUSION

AT any stage of tuberculosis bilateral pleural effusion may occur, but setting aside tuberculous polyserositis and winter influenzal outbreaks in tuberculous persons the condition has not often been described As a complication of chronic pulmonary tuberculosis it is rare, because the pleural cavity becomes partially or wholly obliterated by adhesions from repeated attacks of dry pleurisy Many years ago Wilson Fox noted that 4 per cent of his cases of phthisis had bilateral pleurisy Wilson[2] has recently reported ten instances of bilateral pleural effusion accompanying pulmonary tuberculosis in a series of 1552 persons admitted to the Gaylord Farm Sanatorium, Connecticut, during a ten year period 1928–38 In seven there was definite involvement of both lungs beneath, three having pericardial involvement, one a peritoneal effusion also, and another concomitant bone and joint tuberculosis A coincident effusion into the pericardial sac is not surprising and merely

2 Wilson G C *Amer J Roentgen* 1939, 39 745

indicates that death is not far off. Wilson also noted in his series four instances of bilateral effusion without involvement of the lung parenchyma, one accompanying a tuberculous knee-joint, another a tuberculous kidney, a third iritis and a fourth acute arthritis of fingers and toes, though the tuberculous ætiology of the last two cases was considered doubtful. It is remarkable that so few examples have been recorded as complications of artificial pneumothorax treatment. Wilson states that Forlanini never met with one among the hundreds of patients that he treated, that Saugman had none, and that Braun and Spengler failed to find any records in the literature. The modern practice of producing a bilateral partial collapse may possibly lead to this embarrassing complication.

Bilateral pleural effusion appearing like a bolt from the blue in a previously healthy person is of course another story and fortunately a very exceptional one. In the present issue we publish a record of such a case by G. Hurrell and E. F. Dawson-Walker, in which death followed from terminal miliary tuberculosis, the pleuræ showing at autopsy the oldest lesions. Here the pleural effusion occurred early No Ghon focus is recorded, unless a caseous nodule noted in the right interlobar septum be regarded as one; but the so-called primary foci, often multiple, are common in the subpleural region, and those pleural effusions which usher in a tuberculous illness probably result therefrom. The word allergy is misused and overworked. Employing it in a broad sense to include exudative lesions of serous membranes in all post-primary stages, there may be an early phase soon after the formation of the primary focus and an intermediate one complicating a later lesion, besides those direct extensions to the pleura in the final stages of the disease Bacteriological and immunological characters of the fluid often differ in these three phases

SUPPLY OF MIDWIVES

THE annual report of the Royal College of Obstetricians and Gynæcologists contains a memorandum by Mr. Arnold Walker on the staffing of maternity institutions This was drawn up at the request of the college owing to the difficulties experienced by voluntary maternity hospitals in obtaining an adequate supply of midwives and pupils The memorandum points out that there is no shortage of midwives in the country—the number on the roll is far in excess of requirements—and any difficulties experienced in obtaining applicants for vacant posts can only be due to the greater attractions that other forms of employment offer to the state-registered nurse who is also a midwife. Mr Walker compares the prospects, responsibilities, and social and recreational amenities enjoyed by a nurse who takes up a career in midwifery with those of one who remains a general nurse, or becomes a health visitor, and shows clearly why there is no rush to join the midwifery profession

With regard to pupil midwives, the factors to which he ascribes the shortage in voluntary hospitals in particular are, first, the increase in the number of cases admitted to municipal maternity beds from 60,000 to 123,000 in seven years, secondly, the new training rules of the Central Midwives Board; and thirdly, the introduction of the 48-hour week for nurses. The increase in the number of municipal beds has naturally resulted in a corresponding increase in the number of pupils trained in municipal hospitals. But this has not been accompanied by any falling off in the number trained in voluntary hospitals, the number of pupils trained each year has steadily risen in both groups of hospitals roughly in accordance with the work done. Under the new rules which came into force last summer the length of training of a midwife was doubled, and it was only to be expected that a large number of pupils would come forward to complete their training before that date. Roughly half a normal year's supply of pupils was used up in this way. The slump in entrants that followed was less serious than many had anticipated, and, as every pupil now spends longer in the wards than before, the units of labour represented by the pupils entering the schools had almost reached the 1936 level by May of this year. Their distribution, however, between municipal and voluntary schools shows a definite trend towards the municipal. London voluntary hospitals in particular have done badly. The explanation is undoubtedly financial, and if voluntary institutions are to obtain the pupils they require they will have to offer terms comparable with those offered by municipal institutions The training is now divided into two periods taken at different schools The first period is taken entirely in the larger hospitals and roughly corresponds to the old training The second may be described as an apprenticeship and entails at least three months on the district. Though in order to register as a midwife both parts must be taken, the first is all that should be regarded as necessary for the higher nursing posts which do not involve the regular practice of midwifery If this is generally realised the new rules should not place any additional burden on the majority of students and should have but little effect on the staffing of institutions Mr. Walker points out that the Midwives Act, 1936, can have had no adverse effect on the supply of pupils It has done much to improve the conditions of the midwifery profession and should be the means of attracting pupils rather than the reverse

Mr. Walker concludes that although the immediate shortage of pupils is temporary, there is likely to be a more permanent shortage on account of the great increase in institutional confinements which demand a corresponding increase in nursing staffs To meet this shortage, which includes both trained midwives and pupils, the conditions of service for both must be made more attractive. The suggestion that maternity nursing should form part of the training of every general nurse is, he thinks, subject to grave objections when considered in detail.

YELLOW FEVER BY MOUTH

UP to the present time the only insect vectors of yellow fever which have been found naturally infected are *Aedes ægypti* in Africa and South America and *A. leucocelænus* and *Hæmagogus capricorni* in South America The mosquito can apparently only be infected by sucking blood from an infected man or monkey during the comparatively short period that the virus is circulating in the peripheral blood-stream. This fact, combined with the short life of the mosquito, makes it very difficult to account for the persistence of yellow fever in certain rural areas during dry seasons, when mosquitoes are either absent or present only in small numbers. It has therefore been suggested that other insect vectors of yellow fever may exist which either live longer than mosquitoes or transmit the virus hereditarily. Recently Findlay and MacCallum [1] have shown for the first time that it is possible to infect both the Indian

1 Findlay, G. M., and MacCallum, F. O., *J. Path. Bact.* 1939, 49, 53

rhesus monkey (*Macaca mulatta*) and the African guenon (*Cercopithecus æthiops*) by putting yellow-fever virus into the gastro intestinal tract through a stomach tube They have also found that virulent pantropic yellow fever virus can survive for at least 15 days in the cockroach, *Blatella germanica* Taking these two findings together, non biting arthropods must be considered as possible vectors of yellow fever, especially as many species of monkeys are known to eat grubs and insects in addition to their mainly vegetarian diet

Since the first isolation of the yellow fever virus, continually improved methods for the immunisation of human beings against the disease have been evolved The inoculation of dead virus, even in large quantities, has been found to be quite ineffective either in protecting experimental animals from the disease or producing immune bodies in the blood of humans The aim has therefore been to secure a strain of living virus sufficiently attenuated to give satisfactory immunity without producing marked reactions Such an attenuation was found to occur after many passages through tissue culture with minced chicken embryo, first carried out by Lloyd, Theiler and Ricci[2] At first it was thought necessary to give large amounts of immune serum at the same time as the virus This was highly unsatisfactory, both because of the discomfort to the patient and the difficulties of obtaining large quantities of human immune serum For over two years now the virus has been given subcutaneously without immune serum both in America and London with good results and little after effect However, the finding of Findlay and MacCallum that monkeys can be immunised by oral administration of their vaccine virus opens up the possibility of human immunisation by this route This would greatly facilitate the administration of the vaccine especially under jungle conditions So far attempts at human oral immunisation have failed, probably because the virus is destroyed by hydrochloric acid

MARGARET SANGER

FEW of us are so lacking in the spirit of adventure that we cannot enjoy reading about the work of pioneers Margaret Sanger, pioneer of birth control in the United States, was born to poverty and membership of a long family From an artistic and erratic father, a friend of Robert Ingersoll, she early imbibed a political philosophy essentially radical in outlook. Later, under hard and primitive conditions, she trained as a nurse This experience, coupled with her early upbringing and subsequent work in the slums of New York provided an ideal culture medium for the growth of feministic and other "advanced" ideas Convinced that family limitation was an urgent and necessary step in the progress of human welfare, she set to work, in defiance of the law, to spread information about birth control among working class mothers Such conduct naturally brought her to grips with the Federal Government, and, to avoid trial and imprisonment, she fled first to Canada and later to Europe where she continued her work In England especially she received much sympathy and encouragement from many distinguished persons among them Havelock Ellis, H G Wells and Lord Dawson of Penn So dominated was she by the importance of her task that she became estranged from her husband—who incidentally suffered imprisonment for forwarding one of her pamphlets through the post—and was obliged to remain separated from her three children to whom she was devoted After visiting China, India and Japan, she returned at length to the United States where she stood trial and was put in gaol rather than abandon the cause she had at heart These are a few of the facts revealed in an autobiography[1] written with skill, modesty, humour and simplicity It is the story of a long and ultimately successful fight for an idea, waged with quiet persistence by a physically frail woman who hated the limelight

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On Aug 11 Prof G GREY TURNER of the British *Postgraduate Medical School, is sailing for South America* on behalf of the British Council, which endeavours to promote professional contacts with foreign countries He will visit Buenos Aires Rosario, Córdoba, Montevideo and Chile, and will *return in October via Canada and the United States*

At a meeting of the council of the Royal College of Surgeons of England held on July 31 it was decided to apply for a supplemental charter to give the college power to grant a higher dental diploma entitled "master surgeon dentist" The college will also ask for power to elect annually to the fellowship not more than four members of the college of 20 years' standing

The death is announced of Prof RICARDO JORGE, professor of zoology and anthropology in the University of Lisbon, and formerly president of the public health council of Portugal For many years he was Portugal's delegate to the Office *International* d'Hygiène publique and he was recognised as an authority on smallpox and postvaccinal encephalitis

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INDEX TO "THE LANCET," VOL I, 1939

THE Index and Title page to Vol I, 1939, which was completed with the issue of June 24, is now ready. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W C 2 Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now

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2 Lloyd, W Theiler, M, and Ricci, N I *Trans R Soc trop med Hyg* 1938 29 481

1 Margaret Sanger London Victor Gollancz 1939 Pp 491 16s

THE LANCET 100 YEARS AGO

August 3, 1839, *p* 693

From the evidence of Sir Astley Cooper before a parliamentary committee on medical education

"If I had a son to educate to the profession I should give him a preliminary education, which should continue to 18 years Besides what boys are generally taught, that preliminary education should comprehend Latin sufficient for medical purposes enough Greek for him clearly to understand the derivation of the terms employed in science (as it facilitates exceedingly the acquirement of medical knowledge), and mathematics to a certain extent, to teach him how to reason Having thus educated him in a preliminary way, I should put him for seven years to some hospital * * * Whilst he was engaged as a pupil I should be disposed to send him for a season to Edinburgh principally with a view to his following a course of clinical teaching * * * After having passed a season at Edinburgh, I should spend I am disposed to think, the seventh or last year of his education abroad, and that would bring him to the age of 25 . . ."

SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION

MEETING IN ABERDEEN

(*Continued from p. 274*)

THE association's plan for a general medical service for the nation brings into health insurance not only the dependants of those now insured but also everyone of similar economic standing and everyone now attended under public assistance. Some of the Scottish divisions are not sure that contributory insurance is the best means of providing medical care for so large a proportion of the population.

Capitation Fees or Salaried Service?

At the representative meeting Dr. MARGARET MARTIN, for Edinburgh, suggested that it might be better if the work were paid for directly by the Government. She objected to the present contributory insurance, with its per-capita payment, because it does not cover the family as a unit, because it mixes financial and medical benefit, because it offers no advantage to the doctor of special ability or long experience, and because it makes no provision for pensions or superannuation allowances for practitioners. The insurance principle, she said, is suited to a limited class and a limited risk, but it becomes less and less applicable as the risk covered grows greater The only alternative to capitation-fee payment that had so far been proposed was a whole-time salaried service; but part-time salaried work might prove a solution, compatible with the ideals of the profession and meeting the needs of the public In the Highlands and Islands Medical Service Scotland could show good results from partly salaried practice. Having worked both for salaries and for capitation fees she had found no difference as regards her independence; indeed in insurance practice she had been much hampered. A salaried service, preserving free choice of doctor, could vary remuneration according to ability and experience and could offer pensions. Its management, Edinburgh thought, should be based on hospital regions, and should be in the hands of specially constituted health committees rather than committees of the local authorities

Dr E. R C. WALKER, for Aberdeen, pointed out that a great many intelligent people, both lay and medical, are interested in plans for a more comprehensive medical service. Opinions differed among doctors as among laymen, and it would be unfortunate if the B.M.A. were to take a hard-and-fast line. He sometimes found it awkward to defend the association's policy, because the arguments in favour of its decision to advocate extension of insurance with per-capita payment had never been set out at length The type of administration recommended was held by some to be unworkable, and there was a large body of opinion in favour of alternatives. The association would suffer in reputation if at this stage it got into a position from which it refused to move.

The Chairman (Dr. H G. DAIN) said that the finance of the general medical service scheme is already being considered by a committee, and to give them fresh instructions might be inadvisable Dr. A. H MACKLIN, on the other hand, believed the association should encourage constructive critics to work out their ideas more fully. Dr. W. J. S CAMERON found it significant that the views put forward last year by Glasgow should now be supported by representatives of Edinburgh, Aberdeen, and Dundee—the other three big cities of the north. His explanation was that Scotland has learnt from its opening skirmish over the national maternity scheme. There was a feeling that the plans for a general medical service sacrifice too much to "the general-practitioner principle."

Sir HENRY BRACKENBURY remarked that though these plans, for historical reasons, do not recommend ad-hoc administrative bodies for England there was no reason why different arrangements should not be devised in Scotland. As for finance, it was no business of doctors to decide how the state should raise the money paid them, but only how it should distribute that money. For twelve years the association had consistently opposed the grading of the profession into a civil service paid by salary; for such a change would alter the character of the service given. Why should the council be asked to inquire into the merits of a policy that was the direct opposite of the one the association had adopted? Dr WALKER replied that if the council is convinced of its rightness it should not object to giving a reasoned statement of its opinion. If the B M.A. were to entrench itself in one position, heaven help it. This was no time for dogmatic ex-cathedra statements, and it was vitally important that the association should run no risk of a split.

The meeting agreed with Dr. Walker that the council should be asked to consider and report on the following modifications:—

1. Remuneration of medical personnel by graded and adjusted salary with pension
2. Organisation of the medical service on a regional basis, centred on base hospitals, as designated in the B M.A. medical policy.
3. Ad-hoc administration corresponding to the regional organisation;

and to remit to the Scottish committee to report similarly on the application of such modifications in Scotland

Attempted Suicide and the Law

Dr. J. A. PRIDHAM, for Dorset, contrasted the sympathetic attitude of the law towards successful suicide with its behaviour towards people who tried to kill themselves but failed. To attempt suicide was a misdemeanour; the police waited at the recovering patient's bedside to take a statement, and he might be brought before the magistrates and punished. Recently the chairman of the bench at Weymouth had publicly protested when confronted with a post-encephalitic who had several times attempted suicide On being told of this case the Home Secretary had expressed full sympathy with the magistrate's view, and agreed that suicide as a rule calls for protection and sympathy rather than punishment. He had asked his correspondent for suggestions for alteration in the law, and Dr. Pridham believed the time opportune for the council of the B.M A to put forward such suggestions. If something could be done the B.M A. would reap the gratitude of the public

Dr. R G GORDON (chairman of the mental-health committee) said that such an inquiry need not necessarily take much time, for the National Council for Mental Hygiene had already collected much information Sir KAYE LE FLEMING (chairman of council) also accepted the proposition, but did not view it lightly, since the principle concerned is applicable to other grades of offence. "We are coming rapidly to agreement," he said, "that in a

large section of wrong doing from suicide even to the difficult boy at school, we are dealing with a mental imbalance of some kind where medical help is most likely to be of practical service" Suicide was near one end of a very long scale

The council was asked to report on the advisability of altering the law

Psychotherapy by Laymen

Dr GORDON reviewed the pros and cons of recognising mental treatment by trained laymen A very large number of people, he said, would benefit from psychotherapy, and comparatively few medical men and women were able to give it Many of the patients at present untreated could be helped by the trained layman working under the supervision of the doctor The clergy were often peculiarly fitted for such work, and applications for guidance had come from the churches—especially the Anglicans and the Free Churches, for the Roman Catholics and Church of Scotland, though they thought their clergy should be instructed in psychology, did not want them to set up as psychotherapists So many non doctors were now in psychological practice that it might be well to secure some control of the stream before it became a flood One objection to any such recognition of lay psychotherapists was that their work is essentially the same as the medical psychotherapists' (Whereas chiropodists do what doctors don't) It was said they might multiply and squeeze the profession out of this part of practice, but their training could be made stiff, and no general admission was contemplated A second argument was that to authorise such work by layman would lower the status of psychological medicine at the very moment when its importance as "the other half of medicine" is being realised It was also said that as the experts have not agreed about the training of medical psychotherapists, they will never agree about the training of lay ones Here again the answer was that there is no need to make the course of instruction easy, it might last two years, or it might last more, indeed it might be made so difficult that entrants would prefer to qualify as doctors Having considered these facts the mental health committee asked the representative body to approve the following principles —

(i) No lay psychotherapist should undertake treatment unless (a) the patient has been recommended to him by a registered medical practitioner, or has had his case investigated by such a practitioner at the request of the lay psychotherapist, and (b) the lay psychotherapist has undergone a prescribed and approved course of training

(ii) No medical practitioner should recommend a patient to a lay psychotherapist unless (a) the medical practitioner is himself a specialist in psychological medicine or has referred the case to such a specialist and (b) the medical practitioner has satisfied himself that the lay psychotherapist has undergone a prescribed and approved course of training

(iii) Where treatment is undertaken by a medical practitioner and a lay psychotherapist in coöperation, the responsibility for the case should lie with the medical practitioner and there should be consultation from time to time between the medical practitioner and the lay psychotherapist

It further asked the representative body to express the opinion that "lay psychotherapists should undergo a special training of at least two years' duration on the basis of a curriculum to be agreed upon by the responsible bodies, and that the association take the initiative in putting machinery in motion for the establishment of approved courses of training"

Dr MONA MACNAUGHTON, for Newcastle on Tyne proposed that no action should be taken till a further report was received The principles were too important for rapid decision, and meant another restriction on the work of general practitioners Dr A A EAGGER, supporting, disliked the wider opening of the door to lay competition If there was a shortage of medical psychotherapists the B M A should concentrate on means of inducing more students and doctors to take up this work—e g, by courses at universities and by increasing salaries The aim should be to raise its status, whereas the present proposals would lower it He added that patients with mental disorder almost always have physical disorders demanding attention Sir HENRY BRACKENBURY commended the proposed rules, not as a statement of principles but as a guide to conduct They had been endorsed by the psychological-medicine group, and others outside The association was being asked to say where it stood, and the question was becoming urgent After Dr GORDON had spoken of the risk that other bodies would take action if the B M A did not do so, the meeting expressed its disapproval of more postponement

Marylebone, through Mr A M A MOORE, then tried to amend the proposed principles by omitting the proviso in section (ii) that no practitioner should recommend a patient to a lay psychotherapist unless he is himself a specialist in psychological medicine or has referred the patient to a doctor who is Mr Moore did not want to see the general practitioner's hands tied; but Dr RICHARD EAGER did not want to see the medical psychologist surrender one of his few perquisites Sir HENRY BRACKENBURY was convinced that the primary place of medical psychologists must be preserved, and that it is not within the competence of the general practitioner to select cases suitable for lay psychotherapy Dr GORDON, while subscribing to the general principle that the registered practitioner is competent to do any kind of medical work, regarded this as an exception The practitioner was not to blame for the inadequacy of teaching in psychological medicine when he was a student some years ago, nor for the general lack of opportunities later But in fact he had seldom had a chance to fit himself for the very difficult task of deciding which patients (if any) are suitable for lay psychotherapy —Marylebone's amendment was lost

Dr JOSEPH NUNAN was worried by the process of sanctification of various kinds of lay practice that began some years ago with the registration of medical auxiliaries and continued with the recognition of chiropodists These latest proposals suggested a loss of self confidence in the profession and a readiness to admit incompetence and failure Dr FRANK GRAY said that if doctors as a whole have not yet had adequate training in psychological medicine, was this a reason why other people should be given it? Dr HARRY STALKER pointed out that the mental conflicts of a normal person are not readily distinguishable from early symptoms of disease The lay psychotherapist must necessarily run counter to modern thought because he must dissociate mind from body The pastoral psychotherapist with his religious background could not approach his patient in an altogether unemotional and "biological" way, and might cause distress Mr MOORE said that the medical section of the British Psychological Society strongly condemned the proposals Dr H S HOWIE WOOD referred to the need for a very high standard of professional integrity in all who undertake psychotherapy, and Mr L R BROSTER thought that as endocrine disorder is a common cause of emotional change a training in endocrinology as well as psychology would be required by the lay psychotherapist

He agreed that much nervous illness goes untreated, but he thought laymen should facilitate medical treatment instead of undertaking treatment themselves

Dr. GORDON, concluding the case for the mental-health committee's proposals, said that, before voting, the representatives should ask themselves three questions: (1) Are we doing our duty to the public at large if we confine the treatment of neurotic people to the small number of medical psychotherapists available now or in the next year or two? (2) Are there a number of these people whose disability largely turns on spiritual problems which they have to refer to their spiritual pastors; and, if so, ought these pastors to have some sort of medical training? (3) Is it desirable that the large body of lay psychologists already existing in this country should go forward without any medical control?

The meeting however had already made up its mind not to countenance lay psychotherapy on the terms proposed, and it rejected the draft principles by 102 votes to 75.

Subsistence Allowances for Representatives

Those who represent the divisions and branches at the annual meeting of the association go at their own expense. On Swansea moving that they should be paid a subsistence allowance, Dr. J. C. ARTHUR said he calculated that attendance cost him 7*s* 6*d*. an hour, and since he was paying as much for his seat as for a theatre stall he would certainly not be prepared to apologise to the chairman if reproved for temporary absence. Dr. GEORGE LAURENCE spoke of the need for attendance by younger men and the greater choice of representatives that would be possible if some of the expenses were covered. Dr. GRAY defined "younger" in this connexion as "under 50"; this was the time of life at which men were usually meeting their heaviest expenses in the education of their children; and incidentally attendance at a meeting at the end of July usually prevented a holiday with the children. Dr. W. N LEAK also supported the proposal, but another speaker thought the riper wisdom was found in the later age-groups. Dr. S. NOY SCOTT asked where the association would stop. Would it offer salaries to the council? And pensions? He feared a descent to the level of the House of Commons Dr. DOROTHY MASON said that St Pancras would be glad if representatives were paid, but hoped the annual subscription would not be raised —The motion was lost

Publicity

Dr H. G. DAIN, as chairman of the propaganda committee, reported that despite difficulties much is being done to improve relations between the public as a whole and the profession as a whole. The committee was trying to get a better atmosphere "not for the association but for doctors" Dr. T. A. MORRISON criticised the spending of money on a conference on nutrition and on publicity for safe milk; this was work for the Ministry of Health and not for the B M A Dr. A. W. GARDNER was also dissatisfied, but Mr. ZACHARY COPE thought the prestige of the association was rapidly rising Dr. S W. SWINDELLS spoke of the value of the nutrition conference, which cost the association £200 He kept an advertisement of the B.M A cookery-book in his consulting-room and had sold about 150 copies; his patients said "it is good of you doctors to take an interest in things like this for us." Dr H. S. HOWIE WOOD had noted the failure of some of the older practitioners to distinguish between advertisement on behalf of the profession and advertisement by individuals. To issue information about the safety of milk or the stocking of emergency larders was useful because the public knew that here the doctor had no axe to grind. Dr. A. S. WILSON suggested that money might well be spent in developing an inexpensive method of pasteurising milk efficiently and in showing the farmers how this could be done; many farmers and milk distributors were antagonised by the propaganda of the association. Dr. DAIN pointed out that if the B.M A. said that unsafe milk should not be sold the people who produce and distribute it must inevitably be annoyed Dr. T. H. C. DURHAM urged that doctors should become members of their local corporations and insurance committees, for they could thus influence people who knew and trusted them and believed what they said. Dame LOUISE MCILROY said that governments would listen to voters when they would not listen to the medical profession, and the propaganda committee should try to interest the general public in prevention

Proprietary Medicines

A joint conference of representatives of the B M A. and the Pharmaceutical Society has been studying the possibility of making an approved list of proprietary medicines, but the council has reluctantly decided not to go forward with this at present This decision was criticised by Bournemouth, which considers action overdue, in view of "the constantly augmented flood of circulars now delivered daily by post" Dr. WALTER ASTEN said that unfortunately both practitioners and consultants were unduly suggestible, and an authoritative list was badly needed Sir KAYE LE FLEMING replied that the lowest estimate of the cost of a limited scheme was £2000 a year, and the Pharmaceutical Society, being (like the association) committed to large expenditure on new buildings, could not contribute a penny Dr N C. SIMPSON proposed, but did not press, an amendment from West Suffolk suggesting a limited investigation of hormones, vitamins and barbiturates; he thought the B.M A. would much better spend money on a useful object like this than on propaganda Sir EWEN MACLEAN (chairman of the science committee) said that the work of the council of pharmacy and chemistry of the American Medical Association, despite the gratuitous service of experts, cost £10,000 to £14,000 a year; and the American public was still ridden by proprietary medicines It would not be wise to finance inquiries out of payments by drug manufacturers, and the council felt that nothing more can at present be done —The representative body regretfully concurred

Radiographers: Radiological Reports

Two resolutions affecting radiologists were adopted. The first declares that, while there is no objection to doctors employing non-medical radiographers to take films, the responsibility for interpreting such films must rest with a radiologist or other qualified medical practitioner The second, which concerns reports required by insurance companies, or for other purposes connected with litigation, runs as follows:—

1. A radiograph taken in hospital is part of the hospital record of the case and is the property of the hospital It should not be used for any other purpose without the consent of the hospital, the patient, and the radiologist.

2 Radiological reports are intended for use in the treatment of the patient and should not be communicated to a third party without the consent of the patient The rules of the hospital should show clearly which officer is charged with the duty of making reports on hospital

cases to outside bodies or persons and the responsible officer should, in every case in which a radiological report is involved, consult and secure the assent of the radiologist before making his report

3 The person or body requesting the radiological report should pay an adequate fee to the radiologist

4 Re-examination for medicolegal purposes should be conducted by a radiologist in his private capacity

In introducing these principles Prof A H BURGESS (chairman of the special practice committee) said that senior resident officers, or members of the staff of hospitals, often use—as the basis or most important part of their reports—*the findings of a radiologist* The latter complains that he is seldom even consulted, far less paid a fee

Local and National Health Insurance

Many divisions submitted resolutions urging development and extension of the public medical services established by the profession These resolutions commended the services as a means of maintaining the position of the general practitioner, of implementing the association's policy, and of preparing the ground for the projected general medical service One speaker felt that the council, in its advocacy of the larger scheme, has lost its enthusiasm for the local public medical services, yet these were the salvation of the practitioner and their failure would be interpreted by the Ministry of Health as evidence that the public no longer wants the private doctor, preferring clinics Dr J W BONE (chairman of the general practice committee) maintained that, on the contrary, the council has fostered these services in every possible way, and Sir KAYE LE FLEMING was astonished that anyone could doubt it

As chairman of the insurance acts committee Dr E A GREGG accepted a motion from Leeds demanding further consideration for the provision of consultant and laboratory services to insured persons

Dr G DE SWIET, for Kensington wanted the representative body to express misgivings about friendly societies His motion referred to inequitable distribution of benefits by the societies, their cumbersomeness, and their tendency to hoard money, and he thought their multiple administration expensive and their selection of members incompatible with a truly comprehensive scheme Dr DAIN, however, said that the association has no control over friendly societies, and the meeting was not at the moment disposed to discuss Dr de Swiet's strictures on the present arrangements

Dr C W SOMERVILLE for the Lothians, suggested that a conference of Scottish panel committees and divisions should be held each year He spoke of the remoteness of London and the apathy or antipathy that it engenders among many Scottish practitioners Dr E K MACKENZIE supported him with passion, and, though Dr J B MILLER thought that more representation would increase the difficulty of discovering the wishes of those represented, the suggestion was referred to the council

Short or Long Postgraduate Courses?

The postgraduate instruction of panel practitioners was debated on a motion by Tunbridge Wells recommending extended courses of study at local hospitals as a supplement to intensive courses at central schools. The plan approved in Kent, said Dr A M POLLOCK is to hold several courses a year, each consisting of twelve weekly sessions of three hours, divided into one hour periods in which demonstrations-talks are given with opportunity for discussion In Kent there were 800 insurance doctors of whom only 49 last year found time to go to the intensive courses, and some who went felt that so much was crowded into the fortnight that in six months all was forgotten The local course had the merit of promoting contact between practitioner and specialist, it obliged the teacher to brush up his knowledge before addressing a critical audience of colleagues in general practice, and it was cheaper since no locums or railway tickets or subsistence allowances or lecturers' fees were required

Dr J E STACEY said that for many years such a course has been held in Sheffield every six months, it lasts eight weeks with two 1½ hour sessions twice a week Comparing the results with those of the intensive courses lately started he thought the practitioner gets more benefit from the latter The eight weeks' course beginning with 50 attenders was apt to end with 7 or 8, whereas people felt it incumbent on them to attend throughout the fortnight of an intensive course In a fortnight the practitioner could renovate his knowledge of all branches of medicine, whereas a long course was apt to turn him into a consultoid

Dr GREGG said that the British Postgraduate Medical School has arranged an extended course for London practitioners, and next year four more would be undertaken in the provinces He was sure the Ministry of Health would listen to suggestions

Fees and Rates of Pay

The vexed question of the fee payable to the anæsthetist at a dental operation on an insured person has been before the general practice committee and Dr BONE put forward a tariff that may be summarised as follows —

Where the practitioner provides the gas and apparatus — For administration of nitrous oxide or a similar anæsthetic, ceasing when the operation begins, 10*s* 6*d* for one patient or 7*s* 6*d* per patient if more than one is treated "For other administrations, whatever the anæsthetic, the fee should be one guinea"

Where the dentist provides the gas and apparatus — Extraction of 1–8 teeth, 10*s* 6*d* (or 7*s* 6*d* if more than one patient is treated), 9–12 teeth, 12*s* 6*d*, 13–16 teeth 17*s* 6*d*, 17 or more teeth, £1 1*s*

Dr A S WIGFIELD disliked variation of the fee according to the number of teeth removed, the doctor should be paid for administration of an anæsthetic and not on piece work —But the meeting accepted the tariff

A motion also was passed saying that a minimum fee of a guinea should be payable for an hour's teaching in nursing and hygiene for ambulance lectures, and for first aid lectures to A R P workers Mr G P LANGLEY wanted to excuse officers of the St John Ambulance Association and similar bodies from demanding a fee from their own organisations but Dr H C PELLY SMITH thought they could return it and Dr BONE said there was no obligation to accept it

As regards the remuneration of medical men and women engaged in whole time teaching or laboratory work the council was authorised, for the time being, to give effect to the following scale —

Grade III (junior workers employed on a temporary basis (*a*) workers employed in teaching or research institutions, with opportunities for study for the higher degrees or for research in a well-equipped laboratory; (*b*) workers not provided with such opportunities) —The minimum salary for grade III (*a*) shall be £250 per annum for a practitioner without experience and £300 per annum for a practitioner who has held a resident hospital appointment The minimum salary for grade III (*b*) shall be

£350 No person shall be employed in grade III for a total period of more than three years. These salaries shall not apply to appointments limited to a term not exceeding one year and not renewable.

Grade II (workers who have had three years' experience in grade III or in work of an equivalent character)—The minimum commencing salary shall be £450, rising by annual increments of £25 to £700. Previous service in this grade shall be reckoned in calculating the appropriate salary of a worker transferred to another university or institution to fill a similar post in the same grade.

Grade I (workers whose qualifications, duties and responsibilities justify a position of seniority in status and a higher remuneration, such as the reader or senior lecturer or senior assistant or non-professorial head of a department)—The minimum commencing salary shall be £750 and suitable increments shall be given for capability and length of service.

ANNUAL MEETING

At the formal annual meeting on July 25 Dr Thomas Fraser, C.B.E., D.S.O., D.L., of Aberdeen, was invested with the president's badge by his predecessor, Dr Colin Lindsay of Plymouth, and Sir Beckwith Whitehouse, president-elect, said a few words about Birmingham preparations for next year. At the resumed annual meeting held the same evening delegates from the Canadian Medical Association (Dr. F. G Pedley) and the American Medical Association (Dr. Roger I. Lee) were introduced, together with foreign guests (Prof Einar Meulengracht of Copenhagen, Dr. W. McK. Craig of Rochester, Minn., and Dr. Chevalier L. Jackson of Philadelphia) and representatives and delegates from the Empire overseas. The gold medal of the association was presented to Dr C. O Hawthorne (chairman of the representative body from 1928 to 1931), the Sir Charles Hastings clinical prize to Dr. Helen Jardine of Leyton, and the Middlemore prize to Mr. L. P. Jameson Evans The President delivered his annual address (published in our last issue) and Dr. Dain moved a cordial vote of thanks

Earlier in the day the University of Aberdeen had conferred the honorary degree of LL.D. on Dr. Fraser, Dr. Dain, Professor Meulengracht, and Sir James Elliott, F.R.A.C.S.

THE ANNUAL DINNER

An immense company sat down to dinner on July 27 in the municipal café near the beach, but in due time rose again to greet the Haggis, which was preceded by a piper but served, alas, as a very small savoury. The speeches began with the toast of Town and Gown by Dr HAWTHORNE, with responses from the Lord Provost (Mr. Thomas Mitchell) and the Chancellor of the University (Lord Meston), after which the local alumni surprised their guests by singing a verse of Horace's *Integer Vitæ* Mr. FREDERICK MARTIN was frank but friendly in proposing The British Medical Association, coupled with the name of Mr. H. S. Souttar, the new chairman of council, whom he claimed as the son of an Aberdonian. Mr. SOUTTAR, in his reply, produced evidence that the Government and the profession have confidence in the B.M.A. As for Mr. Martin's personal praises he recalled the reply of the spinster on the announcement of her marriage: "the rumour was untrue but she was grateful for the rumour." Prof J. R. LEARMONTH, speaking of The Guests, was glad that year after year overseas delegates come to the association's meetings, subordinating sometimes race, sometimes creed, and sometimes even political opinions, because above all they wished to serve the cause of health throughout the world. Mr. R G. BOOTHBY had asked a fellow M.P. what he should say; and received the reply "That depends on whether you want an anæsthetic in childbirth." Sir JAMES ELLIOTT wished that those who hold the citadel of the Empire would get to know more of those who hold the outposts Finally Dr. H. EDGAR SMITH, in a speech of graceful and grateful appreciation, proposed The President. Emphasising his urbanity (remarkable in a rustic born outside the 12-mile limit of Aberdeen) and his lack of insularity (despite his preoccupation with the islands of Langerhans before the war and the isles of Greece during it), he summed up by saying that no-one better conforms to the policy of the B.M.A. that the general practitioner should be the keystone of the arch between the layman and the specialist

At the end of the dinner Dr. FRASER gave the toast of Bon Accord (the Aberdeen motto): "Happy to meet; sorry to part; happy to meet again" During more than a week of gatherings—large and small, splendid and homely—Aberdeen expressed this hospitable spirit, and many members of the association must now add affection to the respect they previously had for Aberdonians. The charm of the city and countryside made it easy to understand, if not to share, the Lord Provost's ill-concealed belief that it is the best place on earth.

(*Reports of scientific sections appear on p. 315*)

APPOINTMENTS FOR HOSPITAL OUTPATIENTS

Mr. Alfred M. Lyons, a retired business man of Sydenham Hill, calculates that he has waited 300 hours on an outpatient bench in the past five years[1] Mr. Lyons's case is by no means peculiar. To the great loss of working time which ill health steals from the nation must be added no small amount lost waiting in the outpatient departments of the voluntary hospitals of England. Among the ancient "chronics" an afternoon in outpatients has become a social occasion. For the working man and woman, however, it has all too often meant the loss of a job

In the past, from time to time, efforts have been made to devise outpatient appointment systems, but few have survived to become an integral part of hospital life. For these falls by the wayside numerous causes have been given. Doctors are said to take no notice of them in sending their patients up to hospital. Patients are said to prefer to travel at lunch-time when cheap tram and bus fares can be got. It has even been argued that the chronic refuses to forgo her waiting. On at least one occasion a carefully thought-out system has been blackballed by medical conservatism. For the past five years however the Manchester Jewish Hospital has been working an extremely successful system of outpatient appointments About 80,000 appointments are now made each year and general practitioners are encouraged to make first appointments for their patients over the telephone. Not more than 1 or 2 per cent. of patients fail to keep their appointments without letting the hospital know. The system is greatly appreciated by patients, employers, and even the honoraries, many of whom frequently ring up the hospital to find out how long their outpatients are likely to last, so that private work can be arranged accordingly. The system has enabled the hospital authorities to avoid an extensive reconstruction of the

1 *News Chronicle*, July 26

outpatient department as there are now seldom more than ten or fifteen patients waiting at one time

On July 18 University College Hospital introduced a similar system Before starting, careful investigations were made to find out how many patients each honorary sees on an average in half an hour It was found that surgeons averaged three and physicians two Bookings are accordingly made at half hour intervals for two or three patients At first the system was applied only to old patients, who at each attendance booked an appointment for their next visit It proved completely satisfactory and was therefore extended to new patients, and is now working for twenty one outpatient clinics in all Patients referred from casualty attend the appointments clerk and book a time to see the appropriate specialist New outpatients may themselves ring up or write to the hospital suggesting when they would like to be seen and their convenience is as far as possible studied In addition private doctors are invited to ring up Euston 5050 and ask for the appointments clerk at any time of the day or night, but preferably between 12 noon and 8 P M , and already increasing numbers of doctors are availing themselves of this convenience for their patients Waiting is not absolutely eliminated but is reduced from an average of three hours to under half an hour The appointments list for the day enables the records department to put out on the doctor's desk the notes of all the patients expected and if any fail to appear the presence of the notes provides an automatic means of follow up Patients who attend without an appointment are placed at the end of the appointments list. So far the system is giving complete satisfaction

Why has it taken so many years for this very obvious reform to reach fruition? The University College Hospital system will probably cost the authorities between £400 and £500 per annum in clerical fees, phone calls, stationery and postage Attempts to operate an appointments system without special officers in charge is, we feel, doomed to failure And in the past the unsatisfactory attempts which have been made to eliminate *outpatient waiting have* probably been wrecked by the attempts of hospital authorities to work the systems without spending money In these days of planned utilisation of the nation's man power, time saved for industry is national wealth Money, then spent on efficient hospital appointment systems is money well spent indeed Already at St Thomas's, as noted in our columns, an appointment system for old patients has been introduced In the new Westminster a complete outpatient appointment system will be in operation shortly , at St Mary's Hospital, Manchester, an appointments scheme has been in force since the beginning of the year

It is to be hoped that the other voluntary hospitals will follow these excellent examples The Emergency Bed Service has proved that the outside doctor is ready to cooperate with the hospitals for his acutely ill patients The experience of University College suggests that he will do the same for his less urgent but no less important diagnostic problems

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" We may safely say that in the case of well over half of all the children educated in our elementary schools, their school life is something quite apart from their ordinary life bearing about as much relation to it as an ordinary business man's churchgoing bears to his " —Dr HARRY ROBERTS, *New Statesman*, July 29, 1939, p 172

WORLD CONFERENCE ON CRIPPLES

LONDON, JULY 16–22

Lord NUFFIELD and Mr PAUL KING, president of the International Society for Crippled Children, welcomed the delegates to this conference at the official opening on July 17, when Mr WALTER ELLIOT, Minister of Health, reviewed the rapid development of orthopædics in this country since the late war He said that existing legislation, together with voluntary and municipal organisations throughout the country, had brought the solution of the problem of the ordinary cripple well within sight But the industrial cripple presented more difficulty, and this was why an interdepartmental committee had been set up to inquire into the problem The committee urged that fractures, the most important group of industrial injuries, should receive specialised treatment, and that additional rehabilitation centres were also required

Mr R C ELMSLIE, opening a discussion on preventive orthopædics in childhood, traced the diminution in the incidence of gross deformity during the 39 years since he first attended the orthopædic department of St Bart's as a student Three classes of deformity stood out—those due to rickets, scoliosis, and tuberculosis of the spine With rickets it had been less the growth of our knowledge of the disease than the infant-welfare movement and an adequate milk-supply which had achieved success Physical education was responsible for the present comparative rarity of scoliosis , for this we were first indebted to the Scandinavians Although knowledge of the cause of tuberculosis failed to bring the much needed specific remedy, it stimulated Robert Philip to found tuberculosis dispensaries in 1887 and led to statutory provision for treatment of all forms of the disease. This had undoubtedly contributed to the steady reduction in crippling due to tuberculosis Finally, orthopædic services had enabled surgeons to treat crippling conditions before deformity has actually developed

Contributing to a discussion on the education, vocational training and subsequent employment of the crippled child, Mr CECIL MAUDSLAY (Board of Education) described the British system, and Dr PAUL GUILDAL spoke of his life long experience of work in Denmark. He said that what mattered was intelligent application of the system to the individual The risk of comprehensive legislation is that it may produce undue segregation of physically handicapped children, so making them outcasts from normal society Whenever possible the pre school cripple should be cared for at home so that family ties and affection may develop in the normal way Crippled school children should be day-scholars unless their disability was such that travelling became a major problem/ There should be *separation of mentally*-defective cripples from those of normal mentality Vocational training should be pushed during the school period, since the crippled child's school life is, on account of the treatment he must receive, always shorter than the normal period Resident institutions ought to be as home like as possible and the children should go home for their holidays In short, every effort should be made to give the cripple the outlook of the normal citizen

The case of the industrial cripple was discussed by Dr LICHARDT and Dr LAUTERBACH, who described the excellent system now prevailing in Germany and Mr MAURICE STACK, of the International Labour

Office at Geneva, reviewed existing legislation and methods in Europe and the Americas. The position seemed to be that no one country had a perfect system (the perfect system was probably indefinable at present), but enough was known, and had been worked out in practice, to enable any country to frame laws that would give the industrial cripple the benefits he undoubtedly deserved Progress depended less upon procedure than upon the spirit in which it was pursued. "The disabled of the industrial army," said Mr. Stack, "have a right to the same public concern as the war disabled. Industry cannot operate and produce its fruits if men are not willing to risk their lives and limbs in trades some of which are hardly less dangerous than battle itself."

NORWAY

(FROM OUR OWN CORRESPONDENT)

STERILISATION OF WOMEN

THE Norwegian sterilisation law reflects pretty accurately the ethical standards in vogue when it was framed. It permits sterilisation as a prophylactic of mental disease and of serious bodily disease in the prospective progeny, and when there are reasonable grounds for assuming that the woman will be unfit to care properly for her offspring The possible medical indications include neurasthenia, anæmia, pulmonary tuberculosis, heart disease, mental disease and much else, and such social indications as unemployment or drunkenness on the part of the husband are also included. A careful study has been undertaken by Dr. Bernhard Paus of the 68 women sterilised at the Sauda Hospital between 1926 and 1938 In only 11 were the indications strictly medical, 5 of these being obstetrical or gynæcological cases and the remaining 6 cases of pulmonary tuberculosis. A follow-up study showed that in 15 cases sexual activity was diminished while in 7 it was increased, the increase being attributed as a rule to freedom from the fear of a new pregnancy. Mental conflicts with religious scruples often followed the operation, and in two cases the husbands were assailed by penitent after-thoughts, based on "religion" or frustration, the wife's sexual activity having become much reduced. There were four women who reported that they had lost much of their capacity for and pleasure in work. A surprising number of the patients replied of their own accord that healthy folk ought not to undergo the operation

WEIL'S DISEASE

Until lately Weil's disease was looked on as a pathological curiosity in Norway, and only three cases have hitherto been published in which the diagnosis was confirmed by the demonstration of the leptospira But the disease which seemed rare yesterday because it was overlooked has become almost common today. In the Ullevaal municipal hospital of Oslo seven cases have been observed since 1936, the diagnosis being confirmed bacteriologically in five. As in other countries, the disease seems to be much more common in men than in women or children, doubtless because their employment exposes them to infection. Of the seven Ullevaal cases described by Dr O. Svaar-Seljesaeter in *Nordisk Medicin*, six were adult males In one case the disease followed the bite of a rat, and some of the other patients had worked in rat-infested buildings The highly polluted water of the Aker river, into which two of the patients had fallen, may well have been the source of the infection in them It seems that we shall continue to harbour this disease as long as we harbour rats

VERTEBRAL FRACTURES IN CONVULSION THERAPY

From Dr. Dedichen's private asylum—one of the few in Norway—come disquieting reports as to the frequency of fractures of the spine as a sequel to Cardiazol-shock treatment of various psychoses Dr Dedichen's first case was that of a patient who had been given cardiazol shock before his admission and who had suffered from such severe pain in the back that treatment had had to be discontinued. A radiological examination revealed three severe compression fractures This observation set Dr. Dedichen examining all his cardiazol-treated patients for similar lesions In a short time he had found as many as 6 such cases among 80 patients treated Now seriously perturbed, he sounded one of his colleagues attached to another hospital where convulsion treatment had been given to several hundred patients "Oh, yes," this doctor replied, "We have often had patients complaining of pain between the shoulders, but it is of no importance, and it is confined to the muscles." The tell-tale radiograms came as a disquieting shock. It is suggested that this accident can be prevented by never allowing the patient to double himself up during the treatment.

VACCINAL ENCEPHALITIS

Dr. P. M. Holst, who is in charge of Oslo's fever hospital, considers that the danger of vaccinal encephalitis has by no means passed, just because it enjoys less publicity in the press In 1936 there was no such case in Oslo, but in 1937 there was one case which proved fatal, and in 1938 there were two cases, one of which ended in death Between 1929 and 1933 there were eleven cases out of about 15,000 vaccinations in Oslo In 1935 there were two fatal cases after only 355 vaccinations

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

DYNAMICS OF CROWD INFECTIONS

IN a Honyman Gillespie lecture in Edinburgh last week Dr. A. G. McKendrick said that random movement of human beings is a fundamental factor in epidemiology. Movements of individuals in a crowd may themselves be purposeful but the mass as a whole may be unpredictable. Most contacts in a crowd are random, but the behaviour of the whole human mass may depend on the same laws which govern the movements of the mass of molecules of a gas. The law of mass action seems to apply to human problems. The growth of organisms in broth is another example of mass action. The organisms increase in size by absorbing food, and divide by fission when they reach a certain size The rate of the "reaction" depends on the number of organisms and the amount of foodstuff This phenomenon is also seen in the spread of contagious disease and indeed in the spread of ideas.

The spread of disease through a community depends on many chance circumstances, including the random meetings of units of the community. In studying the course of epidemics it is possible to abstract the essentials, reduce them to diagram form and apply mathematical technique The number of new cases of disease is proportional to the number who are sick and the number who are susceptible The chances

of recovery and the chances of death are both proportional to the number of cases, though, of course, this excludes many important factors such as variations in susceptibility and crowding Each disease has a certain threshold density in the population necessary for the development of an epidemic If an epidemic is allowed to run its course in an isolated community, that is, one in which there are no births *and no immigration*, the curve of the number of susceptibles falls with the appearance of cases, crossing the threshold at the point at which the maximum number of cases occurs Thereafter the number of cases decreases, but the curve of the number of susceptibles also continues to fall, until it straightens out as far below the threshold level as it was above it before the epidemic started The epidemic exhausts itself long before all susceptibles are affected or the organism loses virulence When new members are added to a community by birth or immigration the course of an epidemic is different The curve of susceptibles fluctuates about the threshold level, falling below it when cases increase, this fall reduces the number of cases, then with the introduction of more susceptibles there is another increase in the number of cases The oscillations would theoretically go on indefinitely, but actually they gradually become smaller and die away as the epidemic ceases Each disease has its own threshold of susceptibility If the infectivity is low the threshold is high and vice versa The threshold of a community may be increased by cutting down the chances of infection by public health measures, but continuous rigorous control of this artificial resistance is necessary, for if it fails an epidemic may be rapidly precipitated

CAMPAIGN AGAINST RHEUMATISM

The idea of a national rheumatic service received a set-back when a deputation from the Scottish council of the textile trade unions was received by Mr John Colville, M P, secretary of state for Scotland The deputation urged that, in view of the suffering and economic loss caused by rheumatism, a nation wide system of rheumatic clinics should be established According to the reports of the Department of Health for Scotland, rheumatism was responsible for about one eighth of the total incapacitating sickness among the insured population Mr Colville, replying, said he was aware of the size of the problem Much was being done by voluntary and municipal hospitals and other agencies It was not possible to establish a national service at present, but he would consider what could be done to extend existing work

LANARKSHIRE HOSPITAL SCHEME

A scheme for a great general hospital and maternity and infectious diseases hospitals in Lanarkshire has been projected by the county council together with the town councils of Rutherglen, Coatbridge and Hamilton in collaboration with the commissioner for special areas in Scotland The original cost was estimated at about £900,000, but the figure has now been raised to £1,166,000 The commissioner was asked if he would provide an additional grant in view of the increased cost, but he suggested a cheaper modified scheme—namely, to increase his percentage grant, while retaining the maximum of £500,000, conditional on work being begun before March 31, 1940 The joint committee of the councils concerned now think that the *project may have to be abandoned or at* least greatly modified

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations Each contributor is responsible for the section for a month, his name can be seen later in the half-yearly index

FROM DOCTOR DON

I

As usual I have taken too much on and the prospect of Grains and Scruples, the B M A meeting in Aberdeen, and several lectures, all to be completed before I sail to America on Aug 19, fills me with dismay The kind of thing that will slip easily off your pen, said Mrs Kettle, but things which do that turn me hot and cold when I read them in print The older I get the more I refuse, and yet the more life seems shaped by obligations and forces from without rather than by some inner plan or persistent purpose And so I keep grumbling, and thinking if only I can finish this and get out of that, I shall really be able to do my own work and have leisure to be happy Life at present has the negative virtue of not providing enough leisure to be unhappy, though I suppose according to Schopenhauer one can expect no more A few years ago a lady wrote a book that solved all these difficulties Just keep a diary of every one of your activities, note which left you happy and which didn't, and within a short time you would learn where your happiness lay I have toyed with the idea and it won't work A superficial study of the autonomic nervous system shows that the same stimulus at different times produces entirely different results and the intact organism is a great deal more unpredictable than the autonomic nervous system In most of us the emotions are rather like the weather, though some enjoy a more equable climate than others We know that with a south east wind it will rain long and with a north east it will be cold, but most days we cannot foretell when happiness will break in like sunshine I am so busy that I never lack something to do, and am always looking forward to time for relaxation and hobbies One is haunted by the fear that the day may be gone and the zest for the game departed before one gets out The beauty of transient things takes on a poignant quality, but at any rate one is spared preoccupation with the problem of leisure

* * *

What fun it would be to have a fugue—a Ramble in Aphasia as O Henry somewhat inaccurately entitled his short story on this theme Then I should know what life would have been like if I had gone into the insurance business at 17, though really I should prefer something even simpler than that say a tobacconist's shop One's wants seem small—good food, a comfortable bed, and time to sit in the sunshine or to feel the hill wind on one's face—and why should one work so hard to satisfy them? Would there have to be a Mrs Chaliee? The combination of a good landlady and a bedfellow is undoubtedly appealing, but I think the really successful ramblers in aphasia (whether it is called the Kingdom of Heaven or the lotus island) just have to leave the wife and kids at home It is love that makes the

world go round, and if you want life to stand still you must cut out the sex interest.

"... the end for which they work,
Beasts coupling with the groaning beasts they capture,
And all this dirt for just three minutes' rapture."

I interrupt my writing to go across to the children's school prize-giving. Fortunately it was just not raining after violent storms earlier in the day. One very small boy told his father he thought they'd had enough thunder and lightning and would he tell it to stop Father's failure marks the beginning of his descent from Olympus, and after his brief enthronement he can only look forward to a future of paying bills and being expected to cut up well. What a pity such exquisite children must one day grow up to look like us—homely, battered, raddled, edentulous, kyphotic parents but again I am expecting life to stand still like Keats's Grecian urn.

* * *

A less pleasant reminder of our mortality was a funeral service in a college chapel. In such surroundings the Church of England funeral service attains its full majesty, and he must be hard indeed who can hear without emotion the choir chanting "As soon as thou scatterest them they are even as a sleep; and fade away suddenly like grass . ." Funeral services in hospital chapels are often sadly unimpressive. The congregation is whipped up from somewhat unwilling students and preclinical teachers and a forced-labour battalion of nurses The obsequies are mechanically chanted by a chaplain who did not know the deceased and has taken no pains to find out anything about him. So disgusted was I by my early experience of these services that I decided to add a codicil to my will forbidding one over me My first experience of a more fitting ceremony was Ryle's address at Rowlands's funeral, and I have since become more and more firmly convinced that such a tribute to a colleague by a man who knew and loved him is the best arrangement for these melancholy occasions. Others of the same quality were Nelson on Melly, and all too soon afterwards, Roberts on Nelson—poor Nelson gone like a soldier on Armistice morning before we knew what sulphonamide could do. South of Durham there is no church more beautiful than St. Bartholomew the Great, and Roberts's address was that of a master over his favourite pupil. All these were men who died young or in full career, but most of us feel that sudden death in the late fifties is much less tragic than survival beyond our powers Cerebral atheroma is a long-drawn out tragedy for the audience with no relief before the curtain falls Only a little less pitiable are the withered females, relics of departed husbands or parents, who clutter the hotels of this and other countries, and form one of those elements of forgotten England which the tourist rediscovers. In ancient days these old bodies would have drifted to the edge of the herd and been picked off by marauding beasts The fast car inflicts its toll on them today, but the majority linger on, till one day the dinner-gong calls to them in vain and a few days later a casual group of relations arrives to strike the right note between decorum and festivity at lunch after the funeral.

Talking of forgotten England, a phenomenon which has been insufficiently discussed is the disappearance of the dummy When I went to school as a boy, every doorstep had its baby with a dummy, but now they have become as infrequent as the Norfolk jacket and the beard Like many of the innovations of the pædiatrician and the trained children's nurse—whom I blame almost entirely for the decline of breast-feeding—this move has not been altogether for good. The hygienic gain does not weigh with me, as babies have an ineradicable tendency to pick up and eat dirt from the floor. In the days of the dummy an epoch came, at about 3 or 4 years, when the dummy was banned and the child put away babyish habits of sucking. If babies don't suck a dummy they suck their fingers, and you can't take away fingers; so now children go on sucking their fingers and cherishing their sleep fetishes till well into school life. If I may voice another grievance against the march of modern hygiene it concerns the disappearance of the chamber pot. I am not referring to nocturnal searches round strange houses for the bathroom—or to that memorable evening in the residents' quarters when we had a wonderful if expensive curling match with these articles. Nor shall I discuss that difficult transitional period when it was there, but not used, a mere insurance against some sudden emetic or diuretic catastrophe. Merely as a gardener I lament the disappearance of that invaluable commodity, Household Slops, and all our modern fertilisers and auxins cannot quite replace the loss. The Esquimaux store all their urine in a tub and wash their long tresses in it before their dancing. The chemists extract from it the basic principles of virility and femininity, and I cannot but feel that here lies the clue to the difference between the wonderful blooms of the Chelsea show and the starvelings of my garden

* * *

John Mellanby's death is a major disaster for the Oxford medical school. Only a few weeks ago I was sitting next to him at dinner and he was being, as usual, the advocatus diaboli, suggesting that all human conduct was actuated by selfish motives, and that such ideas as service to humanity were utter cant. I agreed with him, arguing that my own activities were designed merely to release personal inner tensions and to forget for a time that I was a miserable human being, conceived in sin and born to trouble as the sparks fly upward But we were in the minority and the angels won, as well they might, when John was a living contradiction of his own statements His zest in life was great and he communicated to us his joy in Herodotus and Cellini But it was his unselfishness and common sense which were so valuable, when the Oxford medical school had the difficult task of administering a large sum of money with its hands tied. Nor are these universal virtues I am constantly surprised by the amount of jealousy in academic (not merely medical) circles and the extent to which professors will misuse their privileges and block the careers of their subordinates Mr. A. G. H Dent says that large-scale organisations suffer from numerous diseases—"committee-itis, departmental astigmatism, Napoleon complex, passing the buck and so forth"—and one can certainly find all those in a university. The Germanic conception of the professorial status and of the outstanding importance of one's own department, subject and researches, fills me with mingled wrath and amusement The wife of a minor member of the species grumbled for a time at her treatment in a nursing-home, "but as soon as they found out who I was, things were quite all right." Why the inflated self-esteem of *die Gelehrten?* A man needs to be very great before he can afford to be without humility and the milk of human kindness In our youth, said one of my cynical teachers, we choose science, and later on we wish we had chosen money Most

academic workers have no escape road and in the effort to make the most of what they have got, they sometimes lose their poise and exaggerate John Mellanby, on the other hand, was the happy warrior, who had done great things and was perfectly happy in his position and achievements

* * *

When I analyse my own position I often feel it a false one My scientific leanings are those of a student, with an interest in the synthesis and application of knowledge rather than discovery My opinion of clinical science is diffident and I feel that in its strict meaning of bedside science there is not much to be done 2300 years after Hippocrates except applied psychology and therapeutics (though that is quite a lot) It is, however, a necessary evil, for there must always be a province where the patient and the fundamental sciences come into contact Like other unhappy lands, Palestine and the Low Countries, whose fate it is to lie between great powers, clinical science has been the scene of much warfare I confess to having written editorials on both sides, but it has begun to get rather tiresome and I am all in favour of declaring it a neutral zone What then is my armour of righteousness? I suppose the facts that I am here by invitation and feel others must share the blame, that I have "chanced my arm" often enough in the past to show I am prepared to do so in the future, that I have earned quite a respectable living outside the academic fold and could venture out again And so I thank God for the station in life to which he has been pleased to call me, until the fate of these wretched refugees pricks my conscience When I read their curricula vitæ I feel, There but for the grace of God go I How many of us would survive the same scrutiny? The leaves of yesterday clutter up the bound volumes of the *Lancet* and the *Quarterly Journal of Experimental Physiology*, and how much has it all rotted down to? In the groves of science, kissing goes by favour, and a good manner and an elegant trick of presentation will advance a man far along the road A self made Lancashire man told me that the secret of success in business is to get into the "right click," and many of us can count ourselves lucky to have got fairly early into the right clique We are apparently torn between the desires of having the refugees here to bind up our wounds in time of war and of preventing them from eating our bread in time of peace. Shall I give my solution? One day, I hope not very far off, we shall have to provide proper, conservative dental benefit for an insurance panel that will include dependants as well as workers—i.e., the bulk of our population We shall then have nothing like enough dentists to go round If refugees with medical qualifications were encouraged to do the practical training necessary to qualify in dentistry, they might fill this gap and act as a medical reserve for times of war

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Now comes a circular announcing that the Ministry of Health views with disapproval visits to Canada and U S A before the end of September, even though they are for the purpose of attending scientific congresses Well, it would have been a great rush as we had arranged it, a mere tumbling out of railway trains and planes and lecturing (in the specially air-conditioned theatre) and moving on again So perhaps another year we shall have more time

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By Medicus, M P

It is one of the duties of a Member of Parliament to attend at their Lordships' House to take part in the ceremony of the giving of the royal assent to acts of Parliament When the representatives of the House of Commons march in procession through the lobbies to the House of Lords they do so after a summons by a House of Lords official known as Black Rod And when Black Rod comes to the House of Commons to bring his summons the door to the chamber is banged in his face and he knocks ceremoniously three times—with his rod—to demand entry which is at once accorded The procession for the House of Lords goes straight from the House of Commons, the mace preceding it and the Speaker following it Then the faithful commons, or such of them as have gone there stand in a congested crowd behind the bar of the House of Lords to hear the royal assent given Usually it is given by a commission of three peers seated in their robes with hats on their heads and after the document signed by the King "with his own hand" has been read which gives them authority to act a list of bills passed by both houses is read and in Norman French the clerk bows and declares Le Roy le veult"

On Friday last there was a long list of such bills which by the ceremony became acts of Parliament—the members of the commission representing the King, members of the House of Lords and members of the House of Commons present constitute "Parliament" as an entity Among them was the Finance Act which rivets taxation on our necks for a year, various bills promoted by local authorities for sewerage, bridges and similar objects, a bill to prevent damage by rabbits, a bill to develop agriculture and a bill described as "Prevention of Violence (Temporary Provisions)," otherwise the I R.A. Bill This bill passed its final stages in both House of Lords and House of Commons on Friday, and, as the Speaker said, it was a good thing to let the world know that in an emergency Parliament can act with great speed

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It is perhaps also a sign of the times that the House of Lords on Thursday of last week devoted some time and some plain speaking to the Milk No 2 Bill whose passage through the House of Commons, not unchequered with criticism, has been already recorded Lord Feversham in introducing the bill, claimed credit for the government in that it provided £250,000 for milk for mothers and young children in 1938 and increased the sum this year still further He merely mentioned that the money had not been spent and the milk not provided, but announced that "within the last few days" agreement had been reached with the Milk Marketing Board The purpose of the scheme is to enable the local authorities to provide milk for maternity and child-welfare arrangements at 2*d* a pint, a little more than half the ordinary retail price. The cost of milk supplied at less than 2*d* a pint will fall on the local authorities funds but the Exchequer grant will be sufficient to bring the Milk Marketing Board's returns up to 1*s* 2*d* a gallon in the year The distributive margin will be not more than 8*d* a

gallon and the Minister hoped that distributors would coöperate, but he did not mention that the Government had been unable to arrange for this coöperation from July, 1938, to July, 1939.

Lord Onslow raised the question of clean and safe milk, instancing the outbreak of typhoid at Poole and referring to the refusal of the Government to allow Poole and also Glasgow to promote local legislation for pasteurisation of milk Lord Snell spoke of his "almost continuous desire to avoid milk because of the dangers which were associated at least at one time" with its consumption. And it is worth noting that Lord Snell began his working life as a small boy on a farm.

Lord Luke drew attention to the vital question of milk for hospitals and said that every hospital bed needed 1½ pints of milk a day, a total of 7 million gallons per annum out of the 1100 million gallons consumed in the whole country. Lord Luke asked for milk for hospitals at a lower price Milk, he said, now accounts for a quarter of the total cost of hospital provisions and they could use more if the milk were cheaper. The cheap milk for making butter and cheese was mentioned—it may be as cheap as 6*d*. and 7*d* a gallon—but not the cheap milk for umbrella handles, luxury chocolates and other industrial purposes The Earl of Feversham said that the fact that hospitals are doing beneficent work is surely not a reason why producers of milk should give them preferential treatment to the extent of selling their milk at an unremunerative level. His lordship might have been asked if a greater consumption of liquid milk in hospitals at a cheap rate, subsidised if necessary like the milk-in-schools scheme, would not be saner economics than selling it at starvation prices for industrial purposes or, as sometimes happens when an ice-cream factory finds itself with a surplus, using it to flush the drains.

So neither Lord Luke about cheap milk nor Lord Onslow about safe milk got any more satisfaction in the House of Lords than did anyone in the House of Commons.

* * *

The debate on old-age pensions in the House of Commons was a debate on a very live political issue The increase in the average age of the population is making itself felt electorally and many thousands of old-age pensioners from all over the country have recently presented petitions to Parliament asking for an increase of the present 10*s* a week to 20*s*. The Labour Party proposal for contributory old-age pensions of 20*s*. for a single man and 35*s*. for man and wife has attracted the attention of the country and the censure of Government supporters, who say that in these times of financial stringency when we are spending 750 million pounds this year on armaments—only 250 million of which is paid for out of revenue—the Government cannot afford the 29 millions which increased old-age pensions would require during the first ten years But the contrast between the scale of armaments expenditure and that of old-age pensions has upset the psychological balance of contentment with things as they are, and many Government supporters as well as members of the Opposition are strongly in favour of a change The fact that present old-age pensions involve in many cases an appeal for additional help from public assistance has brought the local authorities into the controversy On the day of the debate the Minister of Health received a joint deputation from the Association of Municipal Corporations, the County Councils Association and the London County Council representing the views of every local authority in the country and pressing the Government to take action Mr. Arthur Greenwood for the Opposition and the Prime Minister for the Government were the chief adversaries but neither went to the heart of the matter which lies, as was suggested in the debate, in the creation of a ministry of pensions and insurance which would coördinate under a single roof all pensions and insurance schemes. Old-age pensions are worked at an expense-ratio of about 6 per cent., national health insurance costs 24 per cent., and industrial insurance 32 per cent

Immense sums are paid out each week for various kinds of insurance Annual premiums on burial policies total £65 millions, of which at least £20 millions could be saved by Government administration. And there are great capital assets which the Government could take over also A real and comprehensive insurance and pensions plan is feasible if the assets available are used. The obstacle is not money even at the present time it is wasteful administration of existing services.

FROM THE PRESS GALLERY

Marketing of Milk Products

IN the House of Lords on July 26, when the Milk Products Marketing Scheme, 1939, was approved, the Earl of FEVERSHAM said that it sought powers for the regulation of the marketing of butter, cheese, condensed milk, condensed skimmed milk, dried milk, dried skimmed milk, cream and sterilised cream. It would set up a board elected by producers of the various milk products, and the main objective would be to secure stability in the market for milk products

Earl HOWE called attention to a report that a company which made ice-cream had applied to the Brighton town council for permission to pour 1500 gallons of milk down the drain. He was sure that many people would give a good deal to obtain some of this milk —The Earl of FEVERSHAM said he understood that the milk in question was skimmed and therefore unfit for human consumption. It would receive the approval of the medical officer of health under the cheap-milk scheme. He agreed that every effort should be made to use such milk, but unless it was to be dried or condensed it would not come within the provisions of this marketing scheme, which covered only processed milks, or butter and cheese.—Lord ADDISON cordially agreed with the scheme, but hoped it would not be directed on lines limiting the supply. The incident to which Lord Howe had called attention was only one of many If there had been a scheme for the proper utilisation of milk products this scandalous waste would never have occurred.

[In the House of Commons on July 27 Mr THORNE asked the Minister of Agriculture if he would take action to prevent the Hove Dairy Company from pouring into the Brighton outfall sewers 1500 gallons per day of milk which was the residue from the manufacture of ice-cream; and if he was aware that the borough engineer stated at the council meeting that this milk was perfectly good —Sir WALTER WOMERSLEY replied I understand that an application was made to the Brighton Sewers Board by the dairy company in question for permission to discharge separated milk into the outfall sewer up to a maximum of the quantity stated in the question, in order to cover the contingency of the company not being able to handle or dispose of such supplies in the ordinary course of trade My information is that at no time have the company poured 1500 gallons of separated milk into the sewer, that no milk is at present being disposed of in this way, and that in the past only comparatively small quantities have been so dealt with The Milk Marketing Board is in touch with the company with a view to the avoidance of any waste of separated milk in future]

Lord ELTISLEY said that representations had repeatedly been made to the Ministry of Agriculture as to the need for standardising cream He recently came across a case where cream was supplied containing 23 per cent butter-fat Suddenly, without any intimation to the public, it was altered to 16 or 17 per cent. and the purchasers still believed they were getting the same quality of cream. He suggested that they might have a standardised 50 per cent

cream in ice-cream products and probably also a 28 per cent butter-fat cream

In the House of Lords on July 28 the House to House Collections Act received the royal assent

QUESTION TIME

JULY 27–AUG 2

Midwives and Analgesics

Sir EDMUND FINDLAY asked the Minister of Health what were the analgesic preparations used by state registered midwives and/or certificated nurses on their own responsibility in cases of childbirth —Dr SUMNER SKILL asked whether his attention had been drawn to the resolution passed by the British Medical Association deprecating the use of an analgesic by midwives, and whether, with a view to countering any ill effects of this resolution, he would make a statement to reassure the public as to the complete safety of the administration of gas by midwives —Mr ELLIOT replied I will take the opportunity of stating the position with regard to the administration of analgesics by certified midwives In January, 1936, following a careful investigation the Royal College of Obstetricians and Gynæcologists reported that the administration of nitrous oxide and air by Dr Minnitt's apparatus was safe for use by midwives under specified conditions The Central Midwives Board in October, 1936, accordingly passed a resolution recognising as treatment within the province of a midwife the administration of gas and air by Minnitt's or similar apparatus for the purpose of producing analgesia during labour, subject to the following conditions, which are those specified by the college (1) that she has, either before or after enrolment, received at an institution approved by the board for the purpose special instruction in the essentials of obstetric analgesia, and has satisfied the institution that she is thoroughly proficient in the use of the apparatus, (2) that the patient has within one month before her confinement been examined by a registered medical practitioner who has handed to the midwife a certificate in writing that the patient is in a fit condition for gas-and-air administration and (3) that one other person, being a state-certified midwife or a state registered nurse, or a senior medical student, or a pupil midwife, is present at the time of administration in addition to the midwife in charge of the case The ruling of the Central Midwives Board is the ruling of the statutory authority responsible and it will be seen that it allows the administration of analgesics by midwives in circumstances regarded as safe by the Royal College of Obstetricians and Gynæcologists Under such circumstances I think the public may be completely reassured as to the safety of the administration of gas by midwives

Miss RATHBONE Will the right hon gentleman undertake that this merciful practice of allowing midwives to administer an analgesic will not be interfered with by the selfish attitude of a certain portion of the medical profession who expressed their views the other day ?— Mr ELLIOT: It cannot be interfered with, that is the ruling of the Central Midwives Board which is the statutory authority

Sir EDMUND FINDLAY Will any action be against a midwife without this authority who administers an analgesic, notwithstanding the fact that a doctor might be some 20 miles away ?—Mr ELLIOT A certified midwife can administer an analgesic under the conditions which I have stated and which I think can be complied with by midwives even in distant parts of the country — Viscountess ASTOR Even to ignoring the presence of a doctor ? Sometimes they cannot get another person — Mr ELLIOT It is very desirable that some other person beside the midwife should be there

Dr SUMMERSKILL asked whether the Minister would state the number of local authorities providing a municipal midwifery service who were training midwives in the administration of analgesics and how many were refraining from using their powers —Mr ELLIOT replied: According to the returns made to me by local supervising authorities up to Dec 31 1938 29 of the 188 authorities concerned had made arrangements approved by the Central Midwives Board for the instruction of midwives in the administration of analgesics

Old-age Pensioners Receiving Relief

Mr TINKER asked the Minister of Health the number of persons in receipt of old-age pensions who were also receiving poor law relief in January, 1939, whether this showed an increase over the figures of January, 1938, and, if so, what was the percentage increase —Mr ELLIOT replied On Jan 1, 1939, there were 250,291 old-age pensioners in England and Wales who were in receipt of poor relief, representing an increase of 8 5 per cent on the corresponding number on Jan 1, 1938 The proportion of old age pensioners in receipt of poor relief to the total number of old age pensioners has accordingly also risen slightly, from 10 04 on Jan 1, 1938, to 10 5 on Jan 1, 1939

Nurses for Civil Defence

Mr ROSTRON DUCKWORTH asked the Minister of Health the measure of response to his appeal for extra nurses and auxiliary nurses, respectively, who would be needed in case of war —Mr ELLIOT replied By June 30 over 9000 trained nurses and assistant nurses had been enrolled, and 45,000 women had applied for training as nursing auxiliaries In addition about 24,000 immobile nursing members of voluntary aid detachments have been released from their service obligations with a view to their becoming available as nursing auxiliaries, and enrolment of these is now proceeding

Captain ELLISTON asked whether he, the Minister, could make an announcement as to the pay and conditions for trained nurses and assistant nurses of the Civil Nursing Reserve in war time —Mr ELLIOT replied Yes, Sir Trained nurses supplied by the Civil Nursing Reserve will in war time receive for whole time service a flat rate of £90 per annum, plus board and lodging The corresponding rate for assistant nurses will be £55 Trained nurses in charge of wards will have an additional allowance of £20 per annum In certain cases an assistant nurse may receive up to £65 per annum To these rates will be added free laundry or 3s 6d per week in lieu These rates have been recommended to me by the central emergency committee for the nursing profession, which includes representatives of the principal organisations concerned with nursing, including the General Nursing Council, the Royal College of Nursing, the voluntary hospitals and the local authorities Where trained nurses or assistant nurses are not provided with board and lodging an additional sum of one guinea per week will be payable As already announced, the rate for nursing auxiliaries will be £2 a week non resident for whole time service

Register of University Teachers

Mr SILKIN asked the Minister of Labour whether the register of university teachers referred to in the National Service Handbook had been compiled, and what forms of service they would be called upon to undertake —Mr LEWIS BROWN replied Members of staffs of universities have recently been recircularised to ascertain their willingness to be enrolled on the central register of persons with special qualifications and the bulk of the replies have now been received The object of the register is to provide a ready means of selecting qualified persons for vacancies in war time as and when they may arise, it is not, in general, possible to specify these vacancies in advance, nor is any guarantee given that a post will be offered — Asked what kind of employment they would be called on to undertake, Mr Brown said he could not answer that in reply to a supplementary question There was a whole range of scientific and special forms of employment available

Professional Women and National Service

Mr SILKIN asked the Lord Privy Seal whether he was aware that there were many professional women anxious to render national service but were incapable of taking up physically strenuous work and whether he would make known the forms of national service in which the training and experience of such women could be utilised —Sir JOHN ANDERSON replied Women with special professional scientific or technical qualifications who would be prepared to undertake work of a specialist

character in the event of emergency should communicate with the Ministry of Labour, which is maintaining a central register of the names of persons so qualified who would be available in time of war to meet the needs of Government departments and industrial concerns for additional technical and professional staff.

London University Students and Evacuation

Mr. SILKIN asked the parliamentary secretary to the Board of Education whether he was aware that students of Queen Mary College, London University, were to be evacuated to Cambridge in the event of a national emergency, and whether, as they would be required to pay £2 a week, he would say what steps he proposed to take in the case of those students who had not the means to pay this sum.—Mr. KENNETH LINDSAY replied: The evacuation arrangements affecting London University students are being made by the appropriate university authorities, who will be responsible for considering any necessary financial measures.

Diphtheria Inoculation in Guernsey

Mr. GROVES asked the Home Secretary how many children who had been inoculated against diphtheria in Guernsey, over eight weeks, had contracted diphtheria since the immunisation scheme was started, and how many inoculated children, less than eight weeks after the inoculation, had contracted diphtheria since immunisation started.—Sir SAMUEL HOARE replied: I am informed that the numbers are 23 and 17 respectively.

X-ray Apparatus

Mr. HOPKIN asked the Minister of Health if he was aware that a portion of a large number of X-ray units for civil hospitals in time of emergency now being constructed for or on behalf of the Ministry of Health was being fitted with X-ray tubes of British manufacture and a greater portion with foreign X-ray tubes, although British tubes were available and efficient; and would he recommend that only British X-ray tubes be fitted in all such units.—Mr. ELLIOT replied: The majority of the tubes for mobile X-ray apparatus ordered for the emergency hospitals are to be British and the remainder American. The orders were placed with the British X-ray Engineers' Association and allocated by them to all the firms in the industry in this country. In the present state of the industry it would not be practicable to insist upon the exclusive use of British tubes.

Unemployed Men and Keep-fit Classes

Mr. THOMAS WILLIAMS asked the Minister of Health if he was aware that certain keep-fit classes for unemployed men were unsatisfactory because members of the class become hungrier than usual as the result of exercise and they could not afford any extra food; and what steps were being taken to remove this disability.—Mr. ELLIOT replied: I have no information about the matters referred to, but they do not appear to fall within the province of my department.

Drug Traffic in China

Sir JOHN HASLAM asked the Prime Minister whether the Japanese government had yet been approached with regard to their failure to control opium dens in the Japanese-occupied area surrounding Shanghai, and the distribution of heroin and other drugs in the various parts of China in their occupation.—Mr. BUTLER, under-secretary for foreign affairs, replied: The reply is in the negative, but His Majesty's Government have under immediate consideration possible representations to the Japanese government on the drug situation in the occupied areas of China.

Milk for Expectant and Nursing Mothers and Children

Dr. HADEN GUEST asked the Minister of Agriculture when he anticipated that the plan for providing cheap milk for expectant and nursing mothers and children under five years of age, as provided under the Milk Amendment Act of 1938 and under the Milk Bill of 1939 would come into operation.—Sir REGINALD DORMAN-SMITH replied: I am happy to say that a scheme for the provision of milk to local authorities in England and Wales at reduced prices for consumption by expectant and nursing mothers and children under five years of age was submitted by the Milk Marketing Board and approved by me on July 26. The scheme comes into force as from today and I hope that it will be possible to lay it before Parliament within the next day or two. My right hon. friend the Minister of Health will issue at the same time a circular letter and an explanatory memorandum to local authorities, with whom the initiative will then rest. I cannot at present say how soon it may be possible to bring the arrangements into operation in any given district.

Disability Pensioners

Mr ELLIS SMITH asked the Minister of Pensions how many men were in receipt of disability pensions for injuries received during the great war, and the number that were pensioned at 100, 80, 60, 50, 40, and 20 per cent respectively.—Sir WALTER WOMERSLEY replied: The number of officers and men in receipt of pension for disablement caused by wounds and injuries, as distinct from diseases, on March 31, 1939, was approximately 227,900. The records of my department do not enable me to give separate figures in respect of wound and injury cases for the various rates, but the total numbers of all classes of disability cases pensioned at the rates specified were as follows:—

100 per cent ..	26,703	50 per cent. ..	50,911
80 ,, ..	14,010	40 ,, ..	50,253
60 ,, ..	33,088	20 ,,	112,600

Mr. ELLIS SMITH asked what number of pensioners had died during 1938; how the figures compared with those of the civil population; and how many of the widows were in receipt of a pension under the royal warrant.—Sir WALTER WOMERSLEY replied: If, as I presume, the hon member has disability pensioners in mind, the reply to the first part of his question is the number of deaths from all causes of this class of pensioner of non-commissioned rank, in the financial year ended March 31 last, was 7480. This represents a death-rate of 18·9 per 1000 pensioners. The death-rate for the corresponding age-group in England and Wales was approximately 12·9 per 1000. The records of my department do not enable me to say how many widows of the men who died during the period concerned are now in receipt of pension.

Blood-transfusion Volunteers

Mr. VIANT asked the Postmaster-General if he was aware that members of his department offering themselves as blood-transfusion volunteers were to bear the cost of substitution if called for service, and no sick-pay was to be allowed for sickness arising out of an operation; and whether he would, in the interest of national service, reconsider these conditions.—Major TRYON replied: I assume that the hon. member is referring to the emergency scheme for blood-transfusion volunteers. So far as the clerical staff is concerned there is no objection whatever to their volunteering and no difficulty would arise about their being released for actual blood-transfusions. The remainder of the Post Office staff are for the most part engaged on the maintenance of national services and their release for actual transfusions would necessarily be dependent on the exigencies of the service. The preliminary blood-tests can usually be undergone outside official hours of duty and no payment for substitution would be required in the case of volunteers released for actual blood-transfusions in time of national emergency. I have considered the position as regards sick-pay. In future this will be allowed, subject to the ordinary rules, in the event of sickness arising out of blood-transfusion.

Voluntary Hospitals and Civil Defence

Sir IRVING ALBERY asked the Minister of Health what complaints he had received from the voluntary hospitals concerning the proposed Government contribution in case of war casualties, and what action he proposed to take in this matter.—Miss HORSBRUGH replied: The matter is now under negotiation but the Government have accepted full responsibility for the cost of treatment of war casualties in voluntary hospitals. The Government propose to make payments on account, subject to adjustment at a later date. The precise basis of the payments and points arising out of the proposals are under discussion with the British Hospitals Association.

LETTERS TO THE EDITOR

MEMORIAL TO SIR ROBERT BOLAM

SIR,—For a considerable time before his death many friends and colleagues of Sir Robert Bolam in the University of Durham and in the hospitals associated with King's College had been considering the desirability of making a presentation to him in the form of a portrait There is now a widespread feeling that such a project should be proceeded with as a memorial to him

As is well known, Sir Robert in addition to his recent activities with the new buildings of the medical school had a very long association with the former College of Medicine and with the Royal Victoria Infirmary He served both of these institutions in various capacities In the College of Medicine he was in turn lecturer on physiology and pathology, joint lecturer on physiological physics and chemistry, professor of medical jurisprudence, sub curator of the museum, while in the Infirmary he was assistant physician and pathologist, later becoming the first honorary physician in charge of the skin department and held this post until his retirement from the Infirmary staff in 1931, when he was appointed honorary consulting physician to the skin department The accompanying lectureship in dermatology in the College of Medicine he held from 1914–37 He also served with distinction as the University of Durham representative on the General Medical Council and was well known for his activities on other bodies, notably the British Medical Association, of which he was for some time chairman of council In recent years he devoted much of his time to the administration of the College of Medicine and to the general work of the university, acting as registrar to the college and later as president and chairman of council, he was also in 1936–37 vice-chancellor of the university

Since the reconstitution of the university Sir Robert's main energies were devoted to the erection of the new buildings for the medical school and as chairman of the building board he was able to see the completion of that task. It seems fitting that as the last president of the College of Medicine and as one who devoted so many years to the interests of medical education his name should be perpetuated by a suitable memorial It is proposed therefore to raise a fund, to which subscriptions are invited, to be devoted to the following purposes —

(1) A portrait in oils

(2) A memorial tablet to be placed in a suitable position in the medical school

(3) To augment an existing fund the interest of which is to be applied as a prize in dermatology

We are, Sir, yours faithfully,

LONDONDERRY, J F DUFF, EUSTACE PERCY, ARTHUR M SUTHERLAND, JOSEPH REED, RALPH MORTIMER, R J WILLAN, F C PYBUS, R B GREEN (Dean)

The Medical School, King's College Newcastle-upon Tyne, July 26

A NATIONAL COUNCIL FOR MENTAL HEALTH

SIR,—In your summary last week (p 274) of the report of the Isaversham committee, referring to the proposed new National Council for Mental Health, you state "it appears that the Mental After Care Association has not yet seen its way to coöperate" It is true that this association has resisted the very strong pressure put upon it to become part of a limited liability company by means of what the report calls "a complete merger, each contributing society losing its identity in the corporate whole" It is, however, misleading and inaccurate to describe this difference on principle as a refusal to coöperate

The Mental After-Care Association, which is by a very long way the senior of the organisations concerned, has made unceasing attempt at friendly coöperation with all of them in every possible way and, in particular, by following the principle of "mutual assistance without interference" which is a golden rule for fellow workers in the field of mental health In my dealings with the Feversham committee on behalf of the association I have every reason to believe that my endeavour to maintain a friendly and coöperative attitude, without abandoning principle, was not entirely unsuccessful The general policy of the association was fully expounded at its annual meeting last spring, when, after an admirably impartial review of the whole situation, our chief speaker Lord Blanesburgh summarised our attitude in three words "Coöperation, not amalgamation"

In these circumstances I am sure that you, Sir, will appreciate my desire to remove any misapprehension which the phrase in your summary may have caused —I am, Sir, yours faithfully,

HENRY YELLOWLEES,
Chairman of Council Mental After-Care Association
Grand Buildings Trafalgar Square, W C 2, July 28

RESTORATION AFTER EXCISION OF MAXILLA

SIR,—In your issue of May 27 Mr Greer Walker writes on the application of prosthetic apparatus after excision of the maxilla As regards function as well as time he distinguishes between appliances inserted immediately and those constructed and adapted much later, when healing is complete I suggest that this distinction is not only unnecessary but will lead in many cases to difficulties of the kind he describes In a communication written with the late Mr C H Bubb (*Brit med J* 1916 1, 268) it was shown that separation of the nasal from the oral cavity, restoration of the masticating surface, and restoration of facial contour, could and should be secured at one and the same time, provided that the apparatus was inserted soon after operation—preferably after an interval not longer than three to four weeks This question of functional and cosmetic restoration after destructive operations on the jaws was further elaborated by me in your own columns (*Lancet*, 1920, 2 845) A point hitherto not raised is the possibility in selected cases of hinging the mucoperiosteum on the oral surface of the hard palate and throwing it upwards and outwards to line the raw surface of cheek above the level of the buccal sulcus —I am, Sir, yours faithfully,

Wimpole Street, W 1, Aug 1 PERCIVAL P COLE.

BITOT'S SPOTS

SIR,—Dr Nicholls in your issue of June 24 suggests that there may be two forms of xerosis of the bulbar conjunctiva an acute and a chronic form, and that only in the former do Bitot's spots appear to be covered with a white foam During a recent investigation into vitamin A reserves in African natives it was my good fortune to see several cases where natives who were normally accustomed to a generous and well balanced diet had been forced to subsist on a diet completely lacking in vitamin A

These consisted of native police and servants of prospectors and surveyors who had been in the bush for some considerable time, living almost exclusively upon maize-meal and beans Other cases occurred among a group of school-children who were boarders at a school where the diet provided was essentially similar. Bitot's spots appeared in about 25 per cent. of the cases of night-blindness that occurred, usually between 5 and 9 weeks after the commencement of the deficient diet The foaming type was almost general and was accompanied by excessive lacrimation Contrary to Dr. Nicholls's experiences with what he suggests is the chronic form, these lesions healed up a few days after treatment with large doses of vitamin A had started. Further, night-blindness invariably preceded the development of the spots.

This evidence appears to support strongly Dr. Nicholls's suggestion as outlined above

I am, Sir, yours faithfully,

ALAN MCKENZIE

The Government Hospital, Morogoro, July 26

BRUIT DE FOUET?

SIR,—We have come across an unusual physical sign which we have not seen recorded in the literature The patient concerned was a Zulu male, suffering from pulmonary tuberculosis. He developed a severe pain in the right side of his chest and abdomen. When he was examined a loud leathery pleural rub was evident. We diagnosed a fibrinous pleurisy Diaphragmatic extension would account for the abdominal pain Five days later when the patient was feeling much better, the pleural rub had gone and normal breath sounds were audible When the patient gave a cough a loud crack was heard, as if someone had flicked the end of the stethoscope with a finger The sound recurred every time the patient coughed. We think the explanation was as follows. The cough suddenly tore many sticky fibrinous adhesions, which remained glued together during normal respiration We have not heard this sound before We would like to know if it has been recorded, and if our explanation is correct

We are, Sir, yours faithfully,

C. A H. WATTS,
B M. WATTS

Bishop Roach Memorial Hospital, P O Nkandhla, Zululand, S A., July 21.

PROFESSOR BLEULER

SIR,—Your annotation last week on the death of Professor Bleuler prompts me to record a little story of the great psychiatrist When nearly 80, after he had retired from the directorship of the Burghölzli Mental Hospital, he took up motoring His efforts as a chauffeur were at first distinguished more by enthusiasm than skill. One day, as he was pursuing an erratic course down the main street of Zürich, a cabby shouted at him, "The place for you is the 'Burgholzli". To this, Bleuler shouted back, "my friend! I have only just left it"

I am, Sir, yours faithfully,

Aug 1 L DRIVER

MEDICAL NEWS

Royal College of Physicians of London

At a meeting of the college held on July 27, with Sir Robert Hutchison, the president, in the chair, the following fellows were elected officers for the ensuing year:—

Censors: Sir Maurice Cassidy, Prof W E Hume, Dr Anthony Feiling, and Prof F. S Langmead Treasurer: Sir Charles Wilson Registrar Dr H L Tidy Harveian Librarian Dr Arnold Chaplin Assistant Registrar: Dr Reginald Hilton Library Committee Dr Herbert Spencer, Sir Adolphe Abrahams, Dr J D Rolleston, and Dr Charles Newman Finance Committee: Dr A M. H Gray, Dr J. P Hedley, and Dr H E A Boldero

The following were elected examiners:—

Chemistry Mr J E Facer and Prof W B Tuck, D Sc Physics Mr J H Brinkworth, D Sc, and Prof F L Hopwood, D Sc, Materia Medica and Pharmacology Dr E B Verney, F.R S, Prof E J Wayne, Dr H. A Dunlop, Dr J W de W Gray Thornton, and Prof J H Gaddum Physiology: Prof B A McSwiney and Prof R J Brocklehurst Anatomy: Prof R D Lockhart Pathology: Dr Geoffrey Bourne, Dr F J Nattrass, Prof. J H Dible, and Prof G P Wright Medical Anatomy and Principles and Practice of Medicine. Prof G W Watson, Dr George Graham, Sir Charles Wilson, Prof F E Tylecote, Dr R A Rowlands, Dr J A Drake, Dr Arnold Stott, Dr Geoffrey Marshall, Dr R A Hickling, Dr D T Davies, Dr Kenneth Harris, and Dr H H Carleton Midwifery and Diseases peculiar to Women: Mr Clifford White, Prof A Leyland Robinson, Mr D W Roy, Mr Frederick Roques, and Mr Arthur Gray Public Health: Part I, Dr J M Hamill; Part II, Dr James Ferguson Tropical Medicine: Prof Warrington Yorke, F R S, and Lieut.-Colonel J S Knox Boyd Ophthalmic Medicine and Surgery. Dr J Purdon Martin Psychological Medicine. Part I Dr Eric Strauss; Part II, Dr C P Symonds and Dr G W B James Laryngology and Otology. Mr Lionel Colledge Radiology: Prof Sidney Russ, D Sc., and Dr Russell Reynolds Anæsthetics: Dr C L Hewer Child Health. Dr H C Cameron and Dr Norman Capon Murchison Scholarship (1940): Dr Terence East and Dr H K Goadby

Dr H. L Tidy was re-elected representative of the college on the General Medical Council Lord Horder was appointed Harveian orator for 1940 and Prof Henry Cohen Bradshaw lecturer for 1940 The Moxon medal for researches and observations in clinical medicine was awarded to Sir Arthur Hurst, the Baly medal for physiological researches to Prof C H Best, F.R S. (Toronto); and the Weber-Parkes prize and medal to Sir Pendrill Varrier-Jones for his work on tuberculosis at the Papworth Village Settlement. The Murchison scholarship was awarded to Dr A J M Drennan (Edinburgh)

The following candidates, having satisfied the censors' board, were admitted to the membership —

D R Allison, M D Leeds; I M Anderson, M B Glasg, H C Aston, M B Birm, D A K Black, M B St And, C R B Blackburn, M D Sydney, W A Brend, M D Lond, M E Chinner, M D Adelaide, J F C C Cobley, M B Sydney; D R Davis, M.B Camb, R B Evans, M D Lond, Major J C Gilroy, R.A.M C, M B Edin, Raymond Lewthwaite, M D Oxfd, B J Malley, M B Dubl, S F Marwood, M D Lond, W M Philip, M B Lond, W N Pickles, M D Lond., D S Scott, M B Camb, Ralph Southward, M B Glasg; J F Stokes, M B Camb, Monty Toohey, M B Dubl, Joseph Walter, M B Oxfd, H T H Wilson M B Camb, and Roger Wyburn-Mason, M B Camb

Licences to practise were conferred upon the following 202 candidates (185 men and 17 women) who have passed the final examination of the conjoint board —

Stephen Ackroyd, Camb and Middlesex, G A. S Akeroyd, St Bart's, T D Ap Ivor, Univ Coll, R H Armin, Camb and St Thos, J W Ashley, Oxfd and Middlesex, A H B Atkinson, Middlesex, E H Bailey, Westminster, J P B Ball, Westminster; Rosalind S Barclay, Manc, P H Beales Guy's, A D Bell, Guy's, A J S Bell Tawse, Camb and Middlesex, C J Bintcliffe, St Bart's, Theodore Bliss, Charing Cross, A D Bone, St Thos, Irene M Bower, Manc, L H Boyd, Guy's, J C Bryce, Univ Coll, F R Buckler, Guy's, J L Cardwell, Camb and St Bart's, D M F Carter, Guy's H A C Chalmers, Westminster, Prakash Chandra, Wee Lond and Prince of Wales C K Cole, Guy's, Frank Constable, Univ Coll, J F Cooper, Charing Cross, J G S Crabbe, Birm, R P Crick, King's Coll, J S Crone, Guy's, G S Cross, St Thos, Barbara Cunningham, Camb and Brist, Harbhagwan Das, Prince of Wales, P H Davison, Birm, P F H Dawnay, St Bart's; J H Dean, Camb and Middlesex; V K Desai, Bombay; E P De Silva, Ceylon, M H L Desmarais, St Bart's, H P Dick, Camb and Guy's, O P Dinnick, Middlesex, J F Donovan, Cardiff, A J Drew, Guy's, F L Dyson, Univ Coll, P M Elder, St Bart's, S D Elek, St George's, J R Esplen, Lpool, E G Evans, St. Bart's, R F Evans, Univ Coll; Jacob Feldman, Middlesex, Betty Fox, Brist, D M I Freeman, Lpool, R C Fuller, St Mary's; M R Gardiner, St Thos, J H P Gauvain, St Bart's, J H Gibson, Birm; P W W. Gifford, Birm, P A Gimson, St Bart's; F N Glover, Guy's, J A Glover, Camb and London, N G Godfrey, Sydney, G D Graham, Camb and St Bart's, R N. Grant, Camb and St Bart's, J. H Graves, St Thos, R A Gregory, Univ Coll; C J Griffin, Univ Coll, Aelwyn Griffiths, Cardiff, Peter Griffiths, Univ Coll, Sandow Grodd, West Lond; E. R

Gubbay St George's, Cyril Hamwee Manc B J Harries, Univ Coll, G F Hay, Bitm, K M Hay, Camb and St Bart's, M R Hayes, St George's, G O Haywood, St Mary's, A Helps, London, David Hewspear Manc. J F Holden, Middlesex, E T Holman Manc and Bath Hannah Horton, Manc, D G Howatson, Middlesex, Ruth M Howitt, Camb and King's Coll, F R Hudson, Middlesex, I R Hurford, Brist, J P F Hummel, Leeds, J C A Innes, London, K G Irving Camb and St Bart's, P W Isaac, Camb and St Bart's, S A James, Middlesex, J W W Jay, St Thos, G H P John Camb and St George's, G M Jones Charing Cross, J A Jones, Guy's, P J O Kendall Camb and London, D S Khatri, Bombay, R R Klein, King's Coll, Thomas Kramer London, W C Lawrence Guy's, G C Lee St Thos, A Leigh West Lond, D C Lewin, Guy's, Katharine I Liebert Manc, J S A Linton, St Bart's, L H Lithman Charing Cross, J A Lorimer, Camb and London, Frank Luckett King's Coll, H F Lunn, Guy's, I D MacDonald, St Thos, F M McGown, Camb and London, C W F McKean Camb and St Mary's, Arthur Mackler, King's Coll, P D MacLellan Camb and Univ Coll, L A H McShane St Bart's, J L Malcolm, St And, A R Marshall, Cardiff, P W M Martin St George's, P Massie Manc, Zeta M U Matthews Univ Coll, A J May, Middlesex, W R May, St Mary's, Ivor Mazure Charing Cross, H R Miller, St Mary's, D A Milln London, F L Moll, Guy's, R W Moore, St Mary's, A R D Newsholme, St Thos, James Worth St Bart's, G O Nowell Birm, A O Obunnesian St Bart's, C A Osborn St Thos, G A Owen Westminster, Jeanne L G Palmer West Lond, F H Patel Edin, Eleanor M Pearson, Lpool, H N Peyton St. Bart's, C H Phillips Guy's, F R Philps Univ Coll, M F Pilcher Univ Coll, J Pooley Birm, Porter St Mary's, B W Powell Camb and St Thos, Harry Pozner, Univ Coll, C L Pretre London, Tom Price Lpool, T G Pritchard, Guy's, Margaret P Rhodes Roy Free, J F Richardson, London, P B Riley St Thos, Basil Robinson, Cardiff, Benjamin Roditi, Manc, Kenneth Rostron Lpool, David Rumsey, Univ Coll, R D Rutherford, St Thos, B M Sanderson, St Thos, P T Savage London, Margaret M Schofield, Leeds, F W Schnienburg Cape and London, P D Scott, Camb and London, Israel Segal, Univ Coll, F H Wade Camb and Univ Coll, J T B Wakeham, Guy's, D B Wallis, Camb and Lpool, H R E Wallis, Camb and King's Coll, Eric Wardle Lpool, Margery B Webb, Birm, S E White Westminster, Francis Whitwell St Thos, G S Wigley Guy's, A F Williams, Manc, Gwyn Williams Guy's, John Williams, Birm, A N Wilson London, G F W Wolstenholme, Camb and Middlesex, B W Wood King's Coll, I A F S Wood St Thos, J C Wyatt St. Thos and W J Zorab King's Coll

The following diplomas were granted jointly with the Royal College of Surgeons to the following:—

D T M & H—H W Bennett, M I Bruce, D A Cannon, A J P Coetzee, W W Cowen, J T F de Soyza, C M Hopkins, E A Hunter, L H James, Guan Bee Kruatrachue, Amedeo Limentani, J M Liston, K J Mann, P E G Manson Bahr, Ba Maung, R W D Maxwell, M C Osgood, D H S Rajapakse, H J Riddell, Mariam P Samuel, L M Sanghvi, D K Sundaresan, S I Townsend and M K Wasti.

D O M S—G C Banerji, C J F Blumenthal, G K Burr, W G L Flather, J B George, S N Gupta, J L Hart, G G Hill, Ida Hodder, A L Ieesman, P P Kerwick, Anne L MacDonald, Annabella McGarrity, T P Myles, P K Pal, W D Pierce, V F Pittar, H B Porteous, R L Raymond, Bridget F Riordan, A F I Shields, S R Sinclair, H M Singh, W K Smiley, Edith M Spencer, Harris Stange, H M Symons and L M Turner.

M R—L M Billingham, Madhusudan Das Michael Gelfand, and B D Houston.

Diplomas in anæsthetics public health psychological medicine and laryngology and otology were also conferred on the candidates named at the meetings of the Royal College of Surgeons reported in THE LANCET June 17, *p 1413* and *July 22 p 200*.

The college has closed for cleaning, and will reopen on Sept 11.

Royal College of Surgeons of England

An ordinary meeting of the council of the college was held on July 31 with Mr Hugh Lett, the president, in the chair. Mr L R Broster was re-elected a member of the court of examiners.

Dr Alan Moncrieff was elected to an examinership for the diploma in child health and under the conjoint Board. Mr G K Harrison was re-appointed a Leverhulme scholar for a second year.

The council decided to apply for the grant of a supplemental charter to give the college power to grant a higher dental diploma entitled "master surgeon dentist," and for power to elect annually to the fellowship not more than four Members of the college of twenty years' standing.

A licence in dental surgery was granted to T C Henry. Diplomas of membership and diplomas in tropical medicine and hygiene, ophthalmic medicine and surgery, and medical radiology were granted to the candidates mentioned above in the report of the meeting of the Royal College of Physicians.

The following hospitals were recognised for the six months' surgical practice required of candidates for the final examination for the fellowship:—

Redhill County Hospital, Edgware (the house surgeons to the two senior surgeons) (under special conditions), Grimsby and District Hospital (resident surgical officer).

University of Oxford

On July 29 the following degrees were conferred:—

J M Couchman, L E C Davies, R G Fagge, and N A Neville.

University of London

At recent examinations the following were successful:—

M D

Branch I (Medicine)—I S Buchanan, M A Carpenter, J L Cates, C S Darke (university medal), R B Evans, A C Kanaar, David Landsborough, D H G MacQuaide, J R Phillips, J W Pierce, Hugh Ramsay, J C Roberts, G R Royston, F H Scadding, and J W Todd.

Branch IV (Midwifery and Diseases of Women)—Mary A M Digby and C W F Burnett.

Branch V (Hygiene)—J D Kershaw, V N Leyshon, J P McGladdery, and R O Wolfenden.

FINAL EXAMINATION FOR THE DEGREE OF B D S

—J C Hancock (with honours), Howell Rees, and D L Rugg-Easey.

Group I—K R. Titford.

Group II—W J Head.

Scottish Conjoint Board

The following candidates, having passed the final examination, were admitted licentiates of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow:—

Gerald Abromowitz, W S Aird, Tom Akroyd, George Altenbaum, F P Ampofo, D A Bird, Milton Bregman, G F Calvert, R M I Charles, W J Curran, W N Darling, Edward Dengrove, Gerald Dixon, Carl Drayer, Edith M Druitt, R S Edlington, A F Fletcher, W M Glantz, H T Hardy, Mary K Hargreaves, Barbara J Hawke, David Hochman, J A Hunter, Phillip Jardine, J R K Keatley, Thomas Khattar, R Lavrie, A S Lee, Malek W A W Manny, E B Marke, J G H Maree, S R A Messih, Ian Mickelli, Henry Mullen, A J MacIver, W T B McAllister, C W Orr, H H Pace, E G Patchett, Nathaniel Pearl, T J Reid, Mary Robertson, A W Robinson, J Rosenblatt, Cyril Rudd, Louis Ryterband, G J Sabrin, C D Salmond, Milton Schneider, N M Segal, R M F Smith, F J Stern, I L Theron, G A Thompson, C M Vanniasegaram, and D K Windram.

The following graduates of recognised foreign universities were also admitted licentiates:—

Abraham Adler, A B Alexander, D R Barry, Adolf Beck, Max Caraco, Walter Cohn, Wladimir Griffel, Erich Guttmann, Lewin Hakefeld, A Heimann, R F H Hinrichsen, Mirjam Laufer, Ella Haims Levi, Chain Paree, I F Rosenthal, and Ralph Spira.

Association pour la documentation photographique et cinematographique dans les sciences

The seventh congress of this association will be held in Paris on Oct 12 and 13. Members will meet on the first day at the Palais de la Découverte (Grand Palais) avenue de Selves, and on the second at the Musée Pedagogique de l'Etat, 29 rue d'Ulm. Further information may be had from Dr Charles Claoué, 39 rue Seleffer, Paris, 16e.

Kathleen Schlesinger Fellowship

The Medical Research Council have appointed Dr Gwen-ron Griffiths to this fellowship for the year 1939–40. The fellowship is provided from a fund established by the late Mr Eugen M Schlesinger and Mrs Schlesinger in memory of their daughter and is given for investigations of cysts of the brain or allied conditions. It is ordinarily tenable at the National Hospital for Diseases of the Nervous System, Queen Square, London.

St. Mary's Hospital

The annual dinner of the medical school will be held at Claridge's on Saturday, Sept. 30. Dr Walter Broadbent will be in the chair The annual postgraduate course, which is open to all practitioners without fee, will take place on Sept 28, 29, 30, and Oct. 1

Industrial Health Research Board

The Medical Research Council have appointed Dr. Donald Hunter and Mr Harold E Clay, national secretary of the passenger services group of the Transport and General Workers' Union, to be members of their Industrial Health Research Board in succession to Prof J A Nixon and Mr. R Coppock

Evacuation and Billeting

The Minister of Health is urging local authorities to stress the importance of registration of children to be evacuated House-to-house canvassing, it is suggested, should as far as possible be done in the evening when both parents are at home. Appeal tribunals are to be set up in an emergency in each district, to which householders aggrieved by billeting requirements may appeal. Each tribunal will have three members, of whom one would be a woman. Evacuating authorities are to see that enough midwives are sent with the expectant mothers Arrangements are also in hand for extra isolation accommodation for infectious illnesses and for midday meals at school for evacuated children Prepaid postcards are to be supplied on which the children and mothers may inform their families of their new address

War Neuroses

On July 3 the Minister of Pensions summoned a conference of specialists in nervous diseases and representatives of the Services to discuss the mental and emotional disturbances liable to arise in war-time, and to advise him as to the basis on which treatment and compensation for "fear-neurosis" would best be applied in a war. The chair was taken by Lord Horder and those present included Sir Hubert Bond, Sir Farquhar Buzzard, Dr. Bernard Hart, Dr Gordon Holmes, Mr. J. H. Macdonald, Dr E. Mapother, Dr. H Crichton-Miller, and Dr W. Aldren Turner, the directors-general of the medical services of the Air Force, Army, and Navy, and medical and other representatives of the Ministry of Pensions A subcommittee was appointed to put forward a practical scheme and this held its first meeting on July 31.

Nursing Conditions

The Minister of Health has issued a circular to local authorities drawing attention to certain suggestions made with regard to conditions of work in hospital nursing by the Athlone committee. The accommodation in the nurses' home, the circular points out, should reach a proper standard of comfort Permission to live off the premises of the hospital might be more freely given, particularly if married nurses are in future (as is proposed) more widely employed. Nursing staff, including probationers, should as far as possible be relieved of domestic work through the employment of ward-maids and orderlies Hospital rules should be revised in order to secure the removal of unreasonable restrictions which have often caused dissatisfaction All hospitals should have a time-table showing on-duty and off-duty times for at least a fortnight in advance, and nurses should have at least four weeks' annual leave, with proper notice well in advance. The standard of catering for the staff should be improved and more care should be devoted to the nurses' health Reforms of this kind are desirable not only in order to overcome the shortage of recruits to the nursing profession, but also because they promote the primary object of nursing care, the well-being of the patient, by ensuring the health and contentment of the nurse

At the meeting of the council of the Royal College of Nursing on July 20 Miss Coode, the vice-chairman, reported that the Minister of Health had given sympathetic consideration to the proposals of a deputation from the college dealing with the control of the assistant nurse, negotiating machinery for the nursing profession and pensions The deputation asked that the Government would promote legislation for the licensing of all "who nurse habitually and for gain" so that the public and the state-registered nurse will be protected against competition from unqualified persons and the public cannot be served by an "assistant nurse" when they think they are employing and are paying the fees for a state-registered nurse. The college advocated one general national pension scheme and proposed that the federated superannuation scheme for nurses and hospital officers (contributory) should be adopted for this purpose. This would permit complete freedom for every nurse to move from one service to another as her career advanced and would benefit nursing as well as the individual

TINCTURES BY THE TON

THE supplies department of the L.C.C. has to cater for the physical and mental needs of 113,000 patients, inmates and staff of the L C.C. institutions, not to mention 800,000 teachers, students and school-children who for part of each day are in the council's hands. It is responsible not merely for obtaining estimates and making purchases, but also for storage, delivery and stocktaking Its story for 1938-39 is told by W. T. Wilson, the chief officer of supplies, in his annual report. No less than 459,064 orders were given to the contractors in the course of the year. In the 1938 crisis the department arranged to buy and distribute among other things about 200 miles of black Italian cloth, 150,000 Rawlplugs, 250,000 yards of wire, 28,800 night-lights, and 54,000 candles. The medical supplies section thinks in astronomical terms. No less than 266,000 sulphonamide tablets, 1,284,000 cascara extract tablets, 2,800,000 aspirin tablets and 11,000,000 "tablets, various" found their way into the L.C.C 's capacious dispensaries, if not into their hungry patients' maws Other staggering figures are 11,400,000 units of insulin, 330,000 c cm. of ethyl chloride, 531,312 corks, 79,096 pairs of surgeons' gloves, 39,315 clinical thermometers, 351,012 X-ray films, 16,897,000 yards of bandage and 1,556,000 sanitary towels. It is pleasing to see that administrative expenses amount to only 1·38 per cent. of the total value of supplies (compared with 1·54 per cent. in 1936-37), while costs of receiving, storing and issuing amounted to 8·27 per cent. (compared with 9 21 per cent. in 1936-37).

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 22, 1939

Notifications—The following cases of infectious disease were notified during the week: Smallpox, 0, scarlet fever, 1925; diphtheria, 870; enteric fever, 21 (59 "expected"); pneumonia (primary or influenzal), 474; puerperal pyrexia, 194; cerebro-spinal fever, 28; acute poliomyelitis, 16; acute polio-encephalitis, 2; encephalitis lethargica, 4, dysentery 30; ophthalmia neonatorum, 92 No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 28 was 2900, which included Scarlet fever, 767, diphtheria, 501 (carriers, 19); measles, 17; whooping cough, 740, puerperal fever, 8 mothers (plus 5 babies); encephalitis lethargica, 306, poliomyelitis, 9 At St Margaret's Hospital there were 19 babies (plus 8 mothers) with ophthalmia neonatorum

Deaths—In 126 great towns, including London, there was no death from smallpox or enteric fever, 2 (0) from measles, 1 (0) from scarlet fever, 8 (2) from whooping-cough, 13 (2) from diphtheria, 36 (11) from diarrhœa and enteritis under two years, and 6 (0) from influenza. The figures in parentheses are those for London itself.

West Ham reported 2 deaths from whooping-cough Fatal cases of diphtheria were scattered over 10 great towns, Croydon and Manchester each reporting 2 Portsmouth and Birmingham each had 4 deaths from diarrhœa

The number of stillbirths notified during the week was 213 (corresponding to a rate of 34 per 1000 total births), including 40 in London

OBITUARY

ARCHIBALD YOUNG

MB, BSC GLASG, FFFPS, FACS, DL, JP

Archibald Young, who died on July 23, aged 65, was for fifteen years professor of surgery in the University of Glasgow In the regius chair he was in the line of Macleod and Macewen, his life was consciously directed to enhance its dignity A gift for teaching was stimulated and developed by a wealth of experience collected in many lands He had a natural affinity for study and maintained to the end a strong and lively interest in the welfare of students, during his tenure of the chair he kept ever before him the advancement of scientific surgery by collaboration with other workers and by fostering in his assistants the spirit of research It was no small achievement for a man of his temperament, for as was well said by the Principal of the university, when accepting Young's portrait a week before his death, he had not been very skilful in the art of compromise There was, the Principal surmised, hardly anyone present in that distinguished gathering who had not been at some time or other Young's opponent And Young himself, in returning thanks, said he could remember the time when members of his hospital staff were barely on speaking terms with one another, he felt he had himself played some part in turning unhealthy rivalry into helpful exchange of views What touched him in his own portrait was a suggestion of kindliness which he did not think his face could ever portray, it was, however, the verdict of his colleagues that, although a bonnie fighter, no one with whom he had been brought into contact had ever been his enemy

Annan, Glasgow

Archibald Young was born in Glasgow on Nov 10, 1873, and was educated at the high school and university where he graduated in science before starting on medicine, his particular interest then being vertebrate anatomy Qualifying in 1895 he held house appointments and took a voyage as ship's doctor before becoming private assistant to Coates in the department of pathology and spending two years as senior assistant to Macewen Then the South African war claimed him as civil surgeon and he found an interest in peripheral nerve injury which never left him His work is published in the official surgical report of that war Twenty-five years later, at the suggestion of the Medical Research Council, he was attached as neurological expert to the Scottish Command at the 4th Scottish General Hospital The results of his war studies were embodied in a paper read to the International Congress of Surgery in 1923 and at the Cairo congress of 1936 he summed up what he had learned of sympathetic surgery Periarterial neurectomy, which had in his hands yielded 65 per cent of successes, had he felt fallen into undeserved neglect Young was optimistic on the uses of ganglionectomy in Raynaud's disease, in Hirschsprung's disease and even in chronic arthritis, although other surgeons failed to verify his success and doubted the ability of periarterial sympathectomy to relieve many types of peripheral pain Young had his own left brachial artery stripped as one step in the treatment of chronic X ray dermatitis with ulceration, the first operation relieved his pain and grafts survived on the ulcers, but further intervention a year later failed in both respects

Young was on the surgical staff of the Western Infirmary for 37 years, he was professor of surgery at Anderson College from 1913 and for many years dean of the college At various times he was president of the Royal Medico Chirurgical Society of Glasgow, of the Association of Surgeons of Great Britain and Ireland and of the Royal Faculty of Physicians and Surgeons of Glasgow Many foreign distinctions fell to him, he was one of the few foreign members of the Royal Academy of Physicians in Rome and his intimate knowledge of Italian and French brought him many contacts not only with the work of foreign surgeons but with the surgeons themselves At Strasbourg, whose university made him an honorary graduate, he was a familiar figure Lately he had completed a translation of Leriche's "Surgery of Pain"

Professor Leriche writes "Le stoïcisme discret d'une fin douloureuse, qu'il a vu venir de face, a clairement montré l'exceptionnelle hauteur morale de cet homme loyal et droit, qui fut un travailleur obstiné, de cet homme de caractère qui cachait sous une apparente réserve, parfois ironique, une fine sensibilité et un grand charme d'esprit Le 2 juillet, il m'écrivait son diagnostic impitoyable 'J'ai été heureux,' ajoutait-il, 'd'avoir pu tenir jusqu'au bout de l'année universitaire I have managed to keep the flag flying Je suis résigné et vous fais mes adieux' Ses dernières semaines doivent rester pour nous tous un exemple et une leçon

"Le chirurgien chez lui ne pouvait pas être séparé de l'homme Il était personnel, consciencieux, probe, sincère avec lui même et avec les autres L'opérateur était net et précis, mesuré et décidé Il avait participé à deux guerres Il s'était intéressé aux blessures des nerfs Il avait vu souffrir Il avait souffert lui même Ses pauvres doigts mutilés avaient bénéficié d'une opération décriée Dès lors, il vous le meilleur de lui même au problème de la douleur et à la chirurgie du sympathique

"Bien qu'il fut mon aîné, il avait voulu un jour venir voir mes opérés anciens et récents, désireux de fortifier sa documentation écrite Nous vécûmes ensemble quelques jours de pleine compréhension et, peu après en 1931, dans un mémoire remarqué il prit fait et cause pour la sympathectomie périartérielle, rejetée par beaucoup comme une erreur physiologique à coup sûr inefficace malgré tant de succès obtenus à peu de frais Cette sincérité objective qui ne s'embarrasse pas de la théorie était une des caractéristiques de son esprit Aussi en 1936, au Congrès International du Caire devra-t-il brusquement un débat officiellement limité et jeta dans la discussion sur la base de 72 observations personnelles tous les procédés de la chirurgie du sympathique Sa contribution d'alors à l'étude comparée de la sympathectomie périartérielle et des ganglionectomies demeure une des plus décisives qui soit survenue objective dans la ligne étroite des faits d'observation

"Le thème de la douleur le passionnait de plus en

plus Il en avait compris la haute portée sociale et la valeur de renouvellement pour la médecine entière. Aussi, quand, en 1937, parut un livre sur la chirurgie de la douleur, qui s'efforçait à une synthèse, il demanda aussitôt le privilège d'en faire la traduction. La tâche était rude, ingrate Bien que souffrant déjà lui-même, il se mit au travail avec une ardeur juvénile. Avec une conscience scrupuleuse, il s'ingénia à surmonter toutes les difficultés d'une pensée parfois abstraite, d'une langue concise et personnelle, souvent intraduisible Il retournait les idées et les mots comme il eut fait des symptômes dans un diagnostic hésitant, jusqu'à ce qu'il fut assuré de ne rien trahir Un an après, son livre paraissait. Il eut la grande joie de le voir bien accueilli, conscient d'avoir fait une oeuvre utile pour ses frères en douleur.

"Il voulait poursuivre cette étude de la douleur. Hélas, comme il le disait, avec un humour amer, le 17 juillet, alors qu'on lui remettait le beau portrait que James Gunn a fait de lui : 'One is more or less sure of today ; one is less sure of tomorrow.'

"Pour moi, qu'une amitié profonde, qu'une vraie fraternité intellectuelle unissait à Archibald Young, je veux lui dire, avec mon cordial adieu, un remercîement ému pour l'aide qu'il m'a apportée dans la diffusion des idées aux-quelles j'ai consacré ma vie, en sachant être, lui qui était un Maître, le meilleur des collaborateurs"

Professor Young married in 1911 Anna Stuart and leaves his widow with two sons, one of whom has recently graduated in medicine at Glasgow.

ROBERT WILLIAM REID

M D., LL D ABERD., F.R.C S

Professor Reid, who occupied the regius chair of anatomy in the University of Aberdeen for thirty-six years, died on Friday of last week

He was born at the manse of Auchindoir, Aberdeenshire, in 1851, being the second son of the Rev. William Reid, minister of that parish He studied at Aberdeen University, graduating as M B. in 1872 and M D three years later; in 1881 he became a Fellow of the Royal College of Surgeons of England. He began his career as an anatomist in his alma mater by acting as assistant for a year to Sir John Struthers Thereafter, at the early age of 22, he was appointed demonstrator at St. Thomas's Hospital medical school, London, where he became lecturer in anatomy in 1877. One of the first whole-time anatomists in the London medical schools, he not only reorganised the anatomy department at St. Thomas's but found time for pioneer research upon the topography of the brain, and to THE LANCET of Sept 27, 1884, he contributed Observations on the Relation of the Principal Fissures and Convolutions of the Cerebrum to the Outer Surface of the Scalp—a paper describing and illustrating what has since been called Reid's base line To his work as anatomist he added the duties of vice-dean of the medical school In 1887, when the Anatomical Society of Great Britain and Ireland was founded, he became one of its original members, being elected to its first council and later he filled with distinction the office of president

MacMahon

Reid was appointed regius professor of anatomy at Aberdeen in 1889. With characteristic energy he planned and obtained new rooms for practical work and research, and refurnished the museum to serve teaching purposes. As a fellow of the Royal Anthropological Institute of Great Britain and Ireland he was particularly interested in anthropology, and he set up an anthropometric laboratory where physical characteristics of students were systematically recorded Three important papers based on the data thus obtained were published in collaboration with J. H Mulligan in the *Journal of the Royal Anthropological Institute.* His inception and elaboration of the anthropological museum in the Marischal College at Aberdeen, to which he devoted much time in his retirement, is a remarkable and enduring monument to his memory Amid innumerable objects of interest, carefully catalogued by Reid himself, the museum contains many of his own finds as an investigator of the inhabitants (both prehistoric and modern) of north-east Scotland He cared about the living as well as the dead, and gave useful public lectures on the structure and care of the body. A lectureship in anthropology in the university already bears his name

Reid took a large part in university administration, as dean of the medical faculty, member of the university court, and representative on the General Medical Council from 1896 to 1901. Former students will recall not only his qualities as a teacher, but one who had ever a keen and kindly interest in their welfare. He was a disciplinarian but was just and considerate. He remembered his old pupils long after they left him, and he was known for his helpfulness towards medical students who came from abroad He never married, but his house in Albyn Place, where his sister looked after him till her death six months ago, had an ever-open door.

Professor Reid's elder brother was the late Major General Sir Alexander Reid, the younger was William Reid, medical superintendent of the Aberdeen Royal Asylum.

GEORGE C. M. M'GONIGLE

M D , D.HY DURH., D P H

Dr. M'Gonigle died on Sunday last, aged 51, at Stockton-on-Tees, where he was medical officer of health. He had spent his life in the public-health service and it was natural that in an area where problems of nutrition had been so urgent since the decline of local industries his reports were increasingly full of expedients for the relief of malnutrition Early in 1933 he leapt into notice with a paper read at the Royal Society of Medicine on the strange results of removing a slum population Six years before, some 150 families had been evacuated from the Housewife Lane area, which consisted largely of one-room tenements of bad structure and hygiene, to model houses on the Mount Pleasant estate which seemed to offer everything that sanitary science could demand Nevertheless this subliminated slum population was demonstrably less healthy than a similar population in the Riverside area which remained in its depressed conditions. Many forms of disease contributed to the increased death-rate,

measles cancer, heart conditions, bronchitis and pneumonia predominating This preliminary survey was followed in 1936 by a book, entitled "Poverty and Health" (in collaboration with J Kirby), in which he discussed the lessons of a population removed from a slum area to a new housing estate, when the increased rent reduced the margin available for food Statistically the samples were small but M'Gonigle's knowledge of local conditions and his ability to analyse the expenditure of the poor justified him in assigning to the shortage of protein the blame for such a large (he calculated it as a fourfold) increase on the expected death rate

M'Gonigle was born and remained a Northumbrian The only son of Canon M'Gonigle, formerly vicar of Ellingham, he qualified at Newcastle in 1910 and held resident posts there and at Sunderland before going to Rampton where he became deputy superintendent After serving five years in the war, mostly in France and Italy, he returned to enter the school medical service

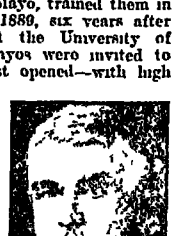
Dr J A Charles writes At the Royal Victoria Infirmary, Newcastle, M'Gonigle was house surgeon to Rutherford Morison At a comparatively early stage in his career he took the diploma in public health, and entered the public health service as a member of the staff of the Durham county health department Whatever may have influenced him in taking this step, whether the family association with local government, for his father, Canon M'Gonigle was for many years a member of the Northumberland county council, or the realisation that for the biologically minded public health offered unexplored opportunities, it was a decision of no little importance to preventive medicine in this country After a short period with the Durham authority, M'Gonigle became medical officer of health of Stockton on Tees, in 1924 In this borough where he was both in word and fact a general practitioner of public health, carrying out all the duties of his office with one medical assistant he spent the remainder of his life Other men, with smaller gifts of mind, have travelled further, but M'Gonigle set aside all his disappointments, and they were many, to immerse himself in the problems of distress and poverty which for many years were outstanding in the life of Stockton He tackled one question after another—rickets dental caries, the nutrition of the rehoused slum dweller—mastering his techniques as he went along, and everything he touched he stripped a little nearer to the central truth There can have been but few more industrious field workers and none more modest or diffident in discussing his achievements, or more helpful to those of his colleagues in the service who looked to him for guidance and inspiration The tributes which most delighted him were invitations to extend the range of his activities and inquiries and requests for his coöperation on department al and other public committees To all of these he contributed abundantly and they compensated him for the preferment which he deserved so richly but never obtained

But apart from his absorption in social medicine M'Gonigle had other interests His friends recognised him as a wise counsellor and elected him to offices in the Society of Medical Officers of Health and the B M A He helped to reorganise his old medical school of which for many years he was a governor To those who knew M'Gonigle only as a recorder of his researches in clear and simple English his real eloquence as a speaker came as a surprise and he was in frequent demand on public platforms throughout the North of England An old infantile paralysis had left him slightly lame, but it also made him the constant friend of every cripple and every handicapped child He was a keen fisherman and his disability did not prevent him from becoming an expert and lively swimmer His early life in a Northumberland parish gave him a love for both the sea and the countryside That in recent years he overtaxed his strength there can be no question, but his restless and inquiring mind was never content to be idle Time was somehow found for new work or to give ungrudgingly and gladly to others the help for which they sought His great characteristics were courage, honesty of purpose, friendliness and loyalty An eager and fascinating spirit has left us, but his work and example will remain

WILLIAM J MAYO

M D, D SC, LL D, I A C S, F R C S

William Mayo, who died on July 28 at the age of 78, was the elder of the brothers who founded the Mayo Clinic at Rochester, Minnesota On the death of Charles Mayo two months ago we gave some account of their origin and early years, and told how their father, William Worrall Mayo, trained them in general practice It was in 1889, six years after William junior graduated at the University of Minnesota, that the three Mayos were invited to staff St Mary's Hospital just opened—with high hopes but few beds—by sisters of the Order of St Francis Two years later W J, as he was called, made the first of his 690 contributions to medical literature, but it was not until the turn of the century that the work of the little Rochester hospital began to be known elsewhere The story goes that William then sent a paper to the *Annals of Surgery* recording so many cases of gall stones treated so successfully that the editor could scarcely believe it, and went to see for himself He was the first of a stream of visitors that has never ceased since From that time W J had in mind the idea of a great clinic or medical centre where group medicine could be practised with its fullest effect In working out this idea his brother Charles was the first and foremost of his collaborators, but it was William who created it and surmounted all difficulties until it bore fruit He lived to see it flourish abundantly, and the brothers Mayo have died with the satisfaction of knowing that their organisation, like many of their ideas, is seemely established and will work without them



After going to Rochester in 1906 Prof Grey Turner wrote "Wherever you travel among surgeons in America you are asked 'Have you seen the Mayos?' and everyone seems either to have been at Rochester or to be going Weir of New York, speaking of the Mayos at the British Medical Association meeting in Toronto, said that for big game his countrymen always looked to the North west, and it was the same in surgery The Mayos were the doctors surgeons and when doctors went to be operated upon in Rochester they always took return tickets" On this first visit Prof Grey Turner was impressed by the rational arrangements, the brothers recognised that "method is the harness without which only the horses of genius travel He noted with

interest the presence of a (well-paid) pathologist at every operation, and the administration of anæsthetics by women; and he admired the Mayos' kindness to visitors, their desire to further the science and art of surgery, their devotion to one another, their industry, their simple technique, and their excellent results At that time, thirty-three years ago, they had already performed partial gastrectomy in 150 cases of cancer of the stomach with a mortality of only 10 per cent. and a three-year survival-rate of nearly 30 per cent; indeed in 1906 they had 36 cases with but 1 death. William Mayo had no use for "the hopeless gastro-enterostomy which enables the patient to live longer and suffer more." With such statistics, said the onlooker, the physician living within travelling distance of the Mayos had no choice but to send them his patients; "and I only wish that our young physicians would with their own eyes go and see what things may be."

At that time the elder Mayo was dreaming of great schemes for improving surgical education and not long afterwards the Mayo Foundation came into being, by which men are enabled to go to the clinic for three years' sustained study, receiving not only their keep but also substantial allowances Rarely can the subject of an obituary speak for himself, but the following extracts from a letter accompanying a large gift to the University of Minnesota reflect the sincerity, purpose, and fidelity of the writer:—

"Our father recognised certain definite social obligations. He believed that any man who had better opportunity than others, greater strength of mind, body, or character, owed something to those who had not been so provided; that is, that the important thing in life is not to accomplish for one's self alone, but for each to carry his share of collective responsibility. Stepping as we did into a large general practice, with a great deal of surgery from the beginning, my brother and I had an exceptional opportunity, and as we entered medical practice during the early period of development of asepsis and antisepsis in surgery which had come through the work of Pasteur and Lister, this opportunity was unique. We were especially fortunate that we had the benefit of our father's large experience to help us apply the modern methods to replace the old type of surgery which up to that time had been practised. There being two of us, with absolute mutual confidence, each of us was able to travel at home and abroad each year for definite periods of study of subjects connected with surgery, as well as to attend medical meetings, while the other was at home carrying on the practice.

"In 1894, having paid for our homes and started a modest life insurance programme, we decided upon a plan whereby we could eventually do something worth while for the sick This plan was to put aside from our earnings any sum in excess of what might be called a reasonable return for the work we accomplished. It seemed to us then, as now, that moneys which should accumulate over and above the amount necessary for a living under circumstances which would give favourable conditions to work and to prepare reasonably for our families, would interfere seriously with the object that we had in view.

"Contented industry is the mainspring of human happiness. Money is so likely to encourage waste of time, changing of objectives in life, living under circumstances which put one out of touch with those who have been lifelong friends, who perhaps have been less fortunate. How many families have we seen ruined by money which has taken away from the younger members the desire to labour and achieve and has introduced elements into their lives whereby, instead of being useful citizens, they have become wasteful and sometimes profligate.

"Medicine constantly became more complex From time to time new members were added to the staff. Each member of the staff received a salary which was sufficient to permit wholehearted attention to his work. There was no profit-sharing—accumulations over and above the amount necessary for the purposes I have outlined were conservatively invested, and have been reinvested, adding all interest to principal.

"Year by year more young physicians applied for positions as assistants and internes in the hospitals. The need of providing in some way a better form of postgraduate medical education for these earnest young men soon became apparent. . . .

"The fund which we had built up and which had grown far beyond our expectations had come from the sick, and we believed that it ought to return to the sick in the form of advanced medical education, which would develop better trained physicians, and to research to reduce the amount of sickness. My brother and I came to the conclusion that this purpose could be best accomplished through the state university.

"In 1913, when our fund seemed to be of sufficient size to warrant the endowment of a foundation at the University of Minnesota to carry out these purposes, we proposed the affiliation After careful consideration, the arrangements were agreed upon June 9, 1913 My brother and I gave to the University of Minnesota a million and a half dollars, which was the entire fund which we had been able to accumulate up to that time, to found the Mayo Foundation for Medical Education and Research, with the understanding that the sum should reach two millions or more before any part of the income should be expended. . . .

"Nineteen years have gone by since the Mayo Foundation for Medical Education and Research was established. The association between the University and the Foundation at Rochester has been most harmonious, and has been distinguished by splendid cooperation on both sides for the benefit of higher medical education and research. The people's money, of which we have been the moral custodians, is being irrevocably returned to the people from whom it came."

Here then is the mature yet unpretentious philosophy upon which the Mayo Clinic has grown and prospered Its development and work have become phenomenal The clinic itself is now so many stories high that it has to be surmounted by a red light on the roof lest it be struck by planes on the Chicago-Minneapolis route But besides the clinic there are many other additions like the hospital floors in the Hotel Kahler, the institute of experimental surgery, the museum on the site of the school where William learnt the rudiments, the hospital laundries, and a host of other activities incidental to what is really a town devoted to healing

But Dr Will was always on the alert to foster the cultural side of the organisation; the record department with its hundred clerks, and the well-stocked library with its study rooms, are examples Staff meetings of all sorts became a regular feature, assistants were encouraged to write for the *Proceedings*, and Mayo himself produced large numbers of valuable papers recording his huge experience in many branches of surgery, especially on the stomach, the intestines and the biliary tract. Their breadth and range can scarcely have been equalled.

In his active professional life of 56 years he became America's most celebrated surgeon, honoured with degrees from twenty-seven universities in twenty different countries. In an age of giants, writes Mr. A H McIndoe, this man stood head and shoulders above the rest, and it is probable the world will never see his like again. His powers of concentration and his iron constitution made him a natural leader, and beginning his career at a time when Lister's principle had been firmly established he

helped in the growth of modern surgery in a community whose economic expansion was just as swift

Prof Grey Turner puts it like this "It has been said that William Mayo was a great administrative surgeon, and that was certainly true He was a man of wide outlook and big ideas who would have shone in big business of any sort But he was also a great doctor and a fine surgeon whose principal ambition was to heal the sick and to give a fairer deal to the patient In all he did he was absolutely honest and I have never known anyone more ready to acknowledge a mistake In many ways he was a giant, but withal a man of simple tastes and small personal ambition who loved his fellow men and the profession which enabled him to serve them."

Dr William Mayo married in 1884 Hattie M Damon, and she survives him One of his two daughters is the wife of Dr Donald Balfour

FRANKLEN FRANKLEN-EVANS
M D CAMB, D P H

Dr Franklen Evans, who died at Buxton on July 26 at the age of 70, was for many years associated with the Devonshire Royal Hospital there The second son of Franklen George Evans, J P, of Llwynarthen, near Cardiff, he studied chemistry at University College, Bristol, and was exhibitioner at St John's College, Cambridge, before going on to clinical work at St George's and University College, London His appointment in 1912 as bacteriologist and radiologist to the Buxton hospital gave him the facilities he desired to continue the study of rheumatoid arthritis begun with Strangeways at Cambridge He was one of the earliest workers in the vaccine treatment of arthritis and had great confidence in a strain of streptococci which he isolated by cultural methods of his own His clinical colleagues certainly saw good results from its employment, but, although he made extensive notes and must have accumulated masses of records, Franklen Evans did not communicate them either to his colleagues or to any learned society After resigning his appointment in 1924 he married as his second wife one of the hospital sisters and continued to work privately as a bacteriologist Outside his work he had many interests, ranging from old music to geological specimens about which he talked with enthusiasm once the ice was broken

JENNER AND NAPOLEON

"Jenner! Ah, to that man we can refuse nothing," said Napoleon The story is a tribute both to Jenner's fame and to the Emperor's enlightenment It was the immediate response to Jenner's petition for the release of two of his friends from detention as prisoners-of-war Prof J A Nixon in a delightful little essay (*Proc R Soc Med* June, 1939, p 877) has given us the details not only of this event but of the many other efforts made by Jenner to secure the release of prisoners-of war both in France and Spain during the unhappy period that followed the demise of the peace of Amiens Such was Jenner's fame that, says Professor Nixon, "English travellers left our shores not with a passport signed by a minister of state, but with a simple certificate bearing the name of Edward Jenner" In recording these examples of Jenner's successful, and sometimes unsuccessful, intervention, Professor Nixon reminds us of the honourable tradition of our profession that science knows no national boundaries but he omits to point out what seems so remarkable and at the same time creditable to science generally, that Jenner leapt into world wide fame in less than ten years from the first publication of his researches

Appointments

BELLINGHAM, ROGER M B Edin, resident surgical officer at the Royal Salop Infirmary, Shrewsbury

BREWER, J K, M B Cape Town F R C S, resident assistant medical officer at the County Hospital, Kingston-on Thames

BROWN, Q S, M B Edin F R C S E M R C O G, hon gynæcologist to the Hull Royal Infirmary

BURCH, JACQUELINE V, M R C S, resident assistant medical officer at the Maternity Hospital Dewsbury

CORFIELD, CHARLES, M D Durh, hon and consulting anæsthetist to the Bristol General Hospital

CRAIG W J, M B Dubl, D M R E, hon radiologist to the East Ham Memorial Hospital

FRASER PHYLLIS M FARNCOMBE, M B Lond, D M R assistant radiologist to the South London Hospital for Women

GREENER, JOAN E, M B Birm, D P H, D P M medical officer to the Mental Deficiency Act Committee for Birmingham

HANDLEY, R S, M B Camb, F R C S, surgical registrar at the Middlesex Hospital London

HIGHET W B, M B N Z F R C S resident medical officer at the Royal Cancer Hospital (Free), London

HUGHES, T LLOYD, M D Lpool, D P H barrister at law, medical officer of health for Bebington and medical superintendent of the Wirral Joint Isolation Hospital.

LANCKNAU, NELLIE I, M D Lond, medical officer in charge of the electrotherapeutic department of St Mary's Hospital, London

LAWSON R P F R C S E D L O L D S R C S hon assistant laryngologist to the Hospital for Consumption Manchester

LEYSHON, V N, M D Lond, D P H, deputy medical officer of health for Dewsbury

LIGHTWOOD, REGINALD, M D Lond F R C P D P H, physician to the department for diseases of children at St Mary's Hospital London.

MCALLUM MIRIAM E, M B Glasg, M M S A assistant medical officer for maternity and child welfare for Preston

MAXWELL E, M D Belf, D M R E assistant to the radiological department of the Royal Infirmary Gloucester

MOORE G A, M S Lond, M Ch Brist, F R C S, hon and consulting surgeon to the Bristol General Hospital

MOORE LEONARD, M B Brist, hon and consulting anæsthetist to the Bristol Royal Infirmary

PEPPER ELIZABETH M B, Lond, D M R E, radiologist to the South London Hospital for Women

PILE, G C L, M B Camb, F R C S, surgical registrar at the Middlesex Hospital, London

ROSE K W L D S Birm assistant school dentist for Nottingham

RUBIN JACK, M B Cape Town F R C S F resident surgical officer at the Royal Hampshire County Hospital Winchester

TAYLOR, N S, M B Lpool assistant medical officer in the venereal diseases treatment centre Salford

THOMSON JAMES, M B, resident medical officer at the Isolation Hospital, Heine Thanet

WILSON, A J, M D Edin, M R C P E, visiting consulting physician to Nuneaton General Hospital

Middlesex County Council—The following appointments are announced:—

CASTLEDEN, L I M, M D Lond, M R C P physician (grade II) at the Redhill County Hospital, Edgware.

COOKEY F S, M D Lond visiting electrotherapist at the Redhill County Hospital, Edgware

HANLEY H G M D Lpool F R C S assistant medical officer at Hillingdon County Hospital Uxbridge

ROGERSON, KATHARINE C, M R C S, assistant medical officer at the West Middlesex County Hospital Isleworth

MURPHY MARY G, M B Lond junior assistant medical officer at the North Middlesex County Hospital Edmonton, and

FOUCHEUX, M B Sydney, junior assistant medical officer at the North Middlesex County Hospital Edmonton.

National Dental Hospital, London—The following appointments are announced:—

HALLON, DOUGLAS, M R C S, L D S R C S hon assistant dental surgeon;

GREEN C DE VERE L D S R C S, D D S Toronto hon assistant dental surgeon and

SCHOFIELD JAMES, M R C S L D S R C S, hon assistant dental surgeon

St Paul's Hospital, London—The following appointments are announced:—

CATTLIN, G T, M D Camb, D M R E radiologist

HANLET, H G M D Lpool, F R C S hon urological and registrar

UNDERWOOD, W E, M B Camb F R C S assistant surgeon

HUMPLE J E M D Camb F R C S, assistant surgeon and HIGHAM, A R C S M B Lond F R C S, assistant surgeon.

Bristol Royal Infirmary and the Bristol General Hospital (Amalgamated)—The following appointments are announced:—

CAPPER W MELVILLE M B Lond, F R C S, M R C O G hon assistant obstetrician

BRADSHAW, F G M R C S, D A, hon anæsthetist, and

LOGAN R B M R C S, D A, hon anæsthetic

Vacancies

For further information refer to the advertisement columns

Anglesey County Council —Asst county M O H , £600
Argyll, Argyll and Bute District Mental Hosp —J A M O , £350.
Ashton-under-Lyne, Lake Hosp —Res obstet O , £350
Barrow-in-Furness County Borough —Asst M O H , £500
Beckenham Hosp ,—Res M O , at rate of £150
Bedford County Hosp —First and second H S , at rate of £155 and £150 respectively
Birmingham, Monyhull Colony Mental Deficiency Institution —Med supt , £1000
Birmingham University —Lecturer in physiological dept , £400
Bootle General Hosp —H S to spec depts , at rate of £150
Bradford, Municipal General Hosp —H P 's and H S 's, each at rate of £150
Bristol Royal Infirmary —Sen res M O , £200
Bury County Borough —Deputy M O H , £750
Cardiff, King Edward VII Welsh National Memorial Association. Three half-time asst. tuberculosis O 's, each £250
Carlisle, Cumberland Infirmary —Res surg O , £250 Also H P , H S , and H S to spec depts , each at rate of £160
Colchester, Royal Eastern Counties' Institution, &c —Med supt for Bridge Home, Witham, £750
Devon County Council —Asst county M O.H and district M O H , £800.
Dover, Royal Victoria Hosp —Two R M O 's, each £140
Dudley, Guest Hosp —Res surg O , at rate of £250–£300. Also H S , £150
Durham County and Sunderland Eye Infirmary —H S , £350
Durham County Council and Seaham Urban District Council —Asst school M O and M O H , £800
East Ham Memorial Hosp , Shrewsbury Road, E 7 —H P., at rate of £150
Edinburgh, Royal College of Physicians —Bacteriologist, £700
Elizabeth Garrett Anderson Hosp , Euston Road, N W 1 — Clin assistantships in gynæcological out-patient dept
Essex County —Temp M O for casualty services, £600.
Huddersfield Royal Infirmary —Cas O , at rate of £200.
Hull, Anlaby Road Institution —Asst M O , £350
Industrial Welfare Society, 14, Hobart Place, S W 1 —Industrial medical officers
King Edward Memorial Hosp , Matlock Lane, Ealing, W 13 — Cas O and H S , at rate of £150
Lancaster, Royal Albert Institution for the Feeble-Minded —Res jun M O , £425
Leeds, Killingbeck Sanatorium —Asst res M O , £250
Leicester City General Hosp —Res M O , at rate of £300
Liphook, Hants, King George's Sanatorium for Sailors —Asst M O , at rate of £200
Liverpool, County Mental Hosp , Rainhill —Asst M O , locum tenens, 8 guineas a week
Liverpool, Fazakerley Sanatorium —Med supt , £750 Also res asst M O , £250
Liverpool University and Liverpool Maternity Hosp —Obstet asst and tutor, £250
London Chest Hosp , Victoria Park, E 2 —H P , at rate of £100.
London Hosp , E 1 —Sen res O , £400 Also clin asst in X-ray dept , £35
London University —Chair of chemistry at Royal Cancer Hosp £1000
Luton Borough —Pathologist and bacteriologist, £650
Manchester, Christie Hosp and Holt Radium Institute —Asst M O , £400 Also two clinical assistantships
Manchester, Crumpsall Hosp —Res asst M O , at rate of £200
Manchester, Duchess of York Hosp for Babies —Jun res M O , at rate of £75
Manchester, Park Hosp , Davyhulme —Res. obstet officer, £400
Manchester, Saint Mary's Hosps —Res obstet O for Whitworth Street Hosp , £150 Asst res obstet O for Whitworth Street Hosp and jun res anæsthetist, each at rate of £100
Manchester City —Res anæsthetists for Crumpsall and Withington Hosp , each at rate of £250
Manchester Royal Infirmary —Res M O , £200
Mansfield and District General Hosp —Res surg O , £250 Also H S , at rate of £150
Mexborough, Montague Hosp —Res surg O , £400
Miller General Hosp , Greenwich Road, S E 10 —H P and H S , each at rate of £100
Newcastle-upon-Tyne Hosp for Sick Children —H P and two H S 's, each at rate of £100
Norwich, Norfolk and Norwich Hosp —Hon dermatologist
Prescot, Whiston County Hosp —Sen res M O , £400
Preston, County Mental Hosp , Whittingham —Deputy med supt , £800
Reading, Royal Berkshire Hosp —Res M O , at Blagrave Branch Hosp and asst to pathologist (combined post), at rate of £150
Rochdale Infirmary and Dispensary —Second H S , £150
Rotherham County Borough —Asst M O H , £600
Royal Naval Dental Service —Dental officers
Royal Naval Medical Service —Medical officers
St Bartholomew's Hosp , E C 1 —Dental H S , £80
St Mary's Hosp , W 2 —Jun asst radiologist, at rate of £75
St Thomas's Hosp , S E 1 —Temp res asst physician, at rate of £225
Southampton, Royal South Hants and Southampton Hosp —Sen H S , £200 Also res anæsthetist and H S to general surgical and ear, nose and throat wards, each at rate of £150
Southampton County Borough —Asst M O H , £500
Sutton Sutton and Cheam Hosp —Jun res M O at rate of £100
Swansea County Borough —Asst M.O , £500
Torquay Borough —Deputy M O H and asst school M O , £600
University College Hosp , Gower Street, W C 1 —Sen asst radiologist, £250.
Walsall General Hosp —Cas H S , at rate of £150.

Births, Marriages and Deaths

BIRTHS

GLEAVE —On July 28, at Cherat, N W.F P , India, the wife of Captain Alfred Gleave, R A M C —a daughter

GORDON —On July 29, the wife of Dr C J Gordon, of Gloucester Place, London, N W 1—a daughter

HONEYWILL —On July 30, at University College Hospital, the wife of Mr L J Honeywill, F R C S —a daughter.

PANK —On July 27, at Srinagar, Kashmir, the wife of Major P E D Pank, R A M C —a daughter

PEERS —On July 23, at Nuffield House, Guy's Hospital, the wife of Dr Anthony Peers—a son

PREWER —On July 28, the wife of Dr R Russell Prewer, of Broadmoor, Crowthorne, Berks—a son.

PROPERT —On July 28, at Colchester, the wife of Dr S A Propert—a daughter

ROGERS —On July 28, the wife of Dr Keith B Rogers—a daughter

MARRIAGES

HARRISON—MARRYAT —*On July 29, at St Matthias Church*, Richmond, Surrey, George Kent Harrison, M D , F R C S, to Mary Marryat

TAYLOR—JARDINE —On July 27, at St Andrew's, Thomas Murray Taylor, advocate, professor of law in the University of Aberdeen, to Helen Margaret Jardine, M D , of Leyton

DEATHS

AIKIN —On July 26, at 66, Bedford Gardens, London, W 8, William Arthur Aikin, M D Brussels, M R C S , aged 82

ATKINSON —On July 26, at Tyrrellspass House, Sybil Atkinson, L R C P I

CHARLESWORTH —On July 27, at 177, Old Brompton Road, London, S W 5, Francis Charlesworth, M B Edin , late of Zanzibar

FAUSSET-FARQUHAR —At Aberdeen, Andrew Grierson Fausset-Farquhar, M B

FRANKLEN-EVANS —On July 26, in Buxton, Franklin Paine Franklen-Evans, M D Camb , D P H , aged 76

JENNER CLARKE —On July 29, in Exmouth, William Jenner Clarke, M R C S , late of Newbury, Berks

M'GONIGLE —On July 30, at Norton-on-Tees, George Cuthbert Mura M'Gonigle, M D , D.Hy Durh , D P H , medical officer of health for Stockton-on-Tees

OGLE —On July 25, at 223, Randolph Avenue, London, W 9, Charles John Ogle, M R C S , in his 84th year

POWER —On July 25, at Berkhamsted, Herts, Henry D'Arcy Power, L R C P I , L S A., late professor of pathology, San Francisco, aged 82

REID —On July 28, at Aberdeen, Robert William Reid, M.D Aberd , L L D , F R C S , emeritus regius professor of anatomy in the University of Aberdeen

SAMPSON —On July 28, Henry Moore Sampson, M R C S , formerly of Painswick, Gloucestershire, and late of Upper Tooting, aged 86

WILLIAMS —On July 23, at Much Birch, Hereford, Edward Cecil Williams, M B Camb , M R C P , formerly of Clifton, Bristol

N B —A fee of 7s. 6d is charged for the announcement of Births, Marriages, and Deaths

HEART OF OAK

WRITING in a racy and conversational style, Dr. I G. BRIGGS recounts his adventures on land and sea in a book which touches on places as far apart as Rangoon, Australia and the Amazon. (The Surgeon Goes to Sea. London: Longmans Green & Co. 1939. Pp. 269. 10*s.* 6*d.*) Interspersed with these reminiscences of travel are anecdotes about practice ashore; about the patients and situations that have come his way; and about his methods of coping with them. He is a keen observer of what goes on around him, and a skilled hand at committing it to paper. Especially good is his sketch of Singapore, which recalls Kipling in its sophistication and economy of language. Though he seems, as a rule, to be a breezy and kindly doctor, he is less concerned than most when his patients seek other advice Whilst admiring his sturdy independence it may be wondered whether a little more tact and a little less downright and brutal truthfulness might not sometimes have achieved more for his patients.

NOTES, COMMENTS, AND ABSTRACTS

PHYSICAL METHODS IN RHEUMATIC DISEASE

In the hope that it may be useful to the medical profession the Empire Rheumatism Council has circulated a report, prepared for its scientific advisory committee by Sir LEONARD HILL, F R S and Mr H J TAYLOR, Ph D We reproduce it in full —

INTRODUCTORY

Proclaimed as of value in the physical treatment of rheumatic disease, there are several forms of apparatus offered to the public Some of these are advertised to the medical profession only, others are advertised to the general community

It is obviously important that these apparatus should be submitted to accurate scientific investigation Some may be altogether useless Others, whilst being in a measure useful, may make claims to have effects which cannot be justified Yet others are questionable from an economic point of view, since the effects which they produce can, by other means, be gained more simply and at a less cost In regard to this last category some consideration should perhaps fairly be given to what may be termed the psychotherapeutic factor If some apparatus which will secure a good effect but at a higher cost than a simpler means can inspire a special degree of faith in the patient, there is no great harm done except to the purse of the purchaser, provided, of course, that no false claims are made, and that the extra charge on "faith healing" account is not unduly excessive That consideration has been kept in mind during the investigation we have made of various claims

The following facts are submitted to members of the medical profession in the hope that they will be of use when they are called upon to prescribe apparatus for rheumatic patients On the general public it cannot be too strongly urged that it is dangerous to employ electrical or other apparatus except on medical advice and under proper supervision

ULTRAVIOLET RADIATION

The active ultraviolet rays which produce sunburn in the skin are the shortest in the sun's spectrum, 0 3 μ Still shorter rays are produced by arc lamps, but these have little power of penetration and such activity as they have on the skin is not different to that of the ultraviolet rays The active ultraviolet rays scarcely penetrate beyond the epidermis, and they affect primarily the living epidermic cells which they damage The inflammatory reaction of sunburn ensues after a latent period owing to the presence of damaged cell products Vitamin D is also produced by the action of these rays on ergosterol in the skin

The iron cored carbon arc in an arc lamp is efficient and is cheaper to run than the tungsten arc The addition of a small quantity of titanium to the tungsten arc does not make any difference to the ultraviolet output of that arc The contrary has been claimed The price of mercury vapour lamps is reasonable, but the charge for stand and reflector usually increases the total cost out of all proportion to their value The artificial sources of light rays produce in truth mainly infrared rays, less than 10 per cent of the radiation being visible light

There is no evidence of the value of different coloured lights other than that of suggestion

INFRARED RADIATION AND OTHER SOURCES OF HEAT

Water in a layer 1 cm thick is opaque to radiation of longer wave length than 1 4 μ. A piece of rat skin 0 41 mm thick absorbs all radiation of longer wave length than 3 μ and partially radiation between 2 μ and 3 μ A dark source of heat which gives all or nearly all its radiation in the form of wave lengths longer than 2 μ can therefore have only a surface heating effect, it cannot penetrate the skin As in the case of a hot-water bath or a hot fomentation heat is conducted in and carried away by the blood circulating in the derma It is therefore unjustifiable to claim that dark sources emit rays of great penetrating power, and an ordinary domestic electric fire may be as good as a "dark heater" sold for treatment purposes at a far higher price For example as compared with an apparatus consisting of a heating coil and reflector costing, say, from 8 to 12 guineas an equally effective piece of apparatus in the shape of a bowl fire can be purchased for from 15s to £1 Red rays and the short infrared rays penetrate through the skin to the greatest depth

Visible rays other than red on penetrating the epidermis are absorbed in the blood of the derma Incandescent lamps are the best sources of the most penetrating rays When a glow lamp is placed in the mouth about 10 per cent of the rays penetrate the cheek, 5 mm thick, of a white man, no rays penetrate the cheek of a negro

The modern gas fire with bright radiants is one source of the more penetrating rays These rays excite flushing and transudation and are more comfortable than rays which heat the surface only It is claimed that the penetrating rays heat tissue under the epidermis more than they heat the surface

The flushing, increased flow of lymph and softening of tissue produced by heat, their analgesic effect and their heightening of tissue metabolism are of great value, and can be obtained by simple inexpensive means such as baths, fomentations and radiant heaters For deep heating the ultra high frequency current can be used This has no specific effect other than heat Low energy high frequency apparatus does not heat, therefore it has no effect other than that due to suggestion, although claims are made to the contrary by salesmen of various apparatus

MILD RADIO ACTIVITY

There is no trustworthy scientific evidence of any biological effect of weak radium doses It is claimed that weak radio active pads now on the market have a beneficial effect on rheumatism If in such a pad 0 1 μmg of radium is put, the cost at the current price of pure radium bromide would be 8s If a raw mineral ore containing radium is used the cost would only be a fraction of this If such a pad is sold for 10 guineas the profit is very great

An electrically heated pad is useful for [illegible] painful parts and can be bought for about 30s If an electrically heated "radio active" pad is sold for 20 guineas the profit is exorbitant No [illegible] of the clinical conditions other than [illegible] been found from treating cases of [illegible] with weak doses of radon

THE CONSTANT [illegible]

The switching on and off [illegible] cause nerve stimulation [illegible] therefore say that no [illegible]

skin. The effect due to electrolysis, however, is confined to surface tissue since the chemical changes take place at the electrodes. The skin flushes owing to the setting free of acid at the positive, and alkali at the negative, poles. The action can be intensified by dipping, before application, the positive (lint-covered) pole in dilute acid, and the negative one in dilute alkali The current is used also for iontophoresis, therapeutically active ions being introduced into the tissues by its passage.

MITOGENIC RADIATION

Gurwitsch first claimed that growing rootlets, dividing yeast cells, &c, emitted radiation in the ultraviolet region of the spectrum. Over 600 papers have been published on the subject. The American Bureau of Standards, after carrying out much research and investigating every claim, have come to the conclusion that such mitogenic rays do not exist.

THE STORY OF HAZELL'S

THE glory and power of printing is not all in the past. Its influence in the present makes it a powerful conservator of human progress. It is the hand-maiden of all the arts and industries, and a most effective worker in the world's workshop, to polish and refine the civilisation of the age. These words of Carlyle's open the story of Hazell's,[1] a story of one hundred years of printing. In 1839 William Paul set up a small printer's business at 14, Kirby Street, Hatton Garden. Four years later the business was purchased by George Watson, whose memory is perpetuated in the firm's full name, Hazell, Watson and Viney. Today the assets of the company exceed £1,000,000, the number of employees has risen from 3 to 1700, and the working hours have fallen from 69 to 45 per week. In 1850 George Watson installed steam to print the *Band of Hope Review*. Seventy-one years later the firm became responsible for the printing of the *Lancet*, and each week our readers may see how well Hazell's discharge this trust The story of Hazell's would be interesting if it recorded only the growth of a great business. But it does more. It gives a picture of the social changes of the past hundred years and tells also of the rise of staff welfare as a feature of progressive capitalist enterprise. Hazell's staff clubs, provident, thrift and pension funds, and even the printing works band, which now broadcasts regularly, all go to show how the benign employer can help the employee One healthy centenarian may pause and forget medicine for a moment to wish many happy returns to another.

THE PROTEIN MOLECULE

THE proteins or albuminoids (to give them an earlier name which is still used) have been recognised as a distinct group of organic compounds for over a century; but their properties are such that investigation by methods which have proved successful in other branches of organic chemistry has not produced results that can be easily interpreted. The importance of proteins as major constituents of living matter, however, has kept them in the foreground as an object of research, and many facts about them have accumulated. Thus, Richter's textbook [2] contained a calculation of the composition of crystallised albumin as $C_{720}H_{1124}N_{216}S_8$, due to Stohmann and Langbein; an estimate by Sabanjeff of the molecular weight as about 15,000, which agrees fairly with that calculated from the formula; and the statement that the products of the decomposition of proteins with acids were mainly fatty amino-acids. The sensitiveness of proteins to reagents seems to have been recognised early, especially the readiness with which egg-albumin forms an insoluble complex with mercuric compounds—a fact which saved the life of the chemist Thénard (1777–1857), who, having accidentally drunk a solution of mercuric chloride instead of a glass of water during a lecture, sent out for eggs and, having swallowed the whites, recovered rapidly from what would otherwise have been a fatal drink. The renewed interest in colloids, after the earlier researches of Graham (1805–69) had almost been forgotten, led to further discoveries about proteins Svedberg, using the ultracentrifuge, determined the molecular weights of several of them and found that these weights were mostly multiples of 18,000, that of egg-albumin being about 36,000. That of the virus of the tobacco mosaic disease is about 50,000,000 More recently Dr. Dorothy Wrinch [3] has, as a necessary preliminary to the investigation of the structure of chromosomes, analysed the available data relating to that of the proteins. She postulates, instead of a simple but improbable long chain of carbon compounds, a repetition of structural units from which are derived polyhedral forms suited to the globular proteins. Support is given to this cyclol theory by Langmuir,[4] who has also collaborated with Wrinch [5] in suggesting the probable structure of insulin according to the cyclol theory. In the discussion of this paper Prof. J. D. Bernal declared his inability to accept the proposed structure; but Dr. Dorothy Jordan Lloyd said that it was very helpful in "pulling recorded facts together and suggesting new lines of work."

1 H J Keefe: A Century of Print The Story of Hazell's 1839-1939. London: Hazell, Watson and Viney Pp 224 10s 6d

2. Richter, V von, Organic Chemistry, 1899, 3rd Amer ed., Philadelphia

3 Wrinch, D., *Nature, Lond* 1936, 137, 411
4 Langmuir, I., *Proc phys Soc Lond* 1939, 51, 592.
5 Langmuir and Wrinch, *Ibid*, p 613

PRACTITIONER'S PROGRESS

EVERYBODY has at least one story to tell but not everybody could render so entertaining an account of his stewardship as the pseudonymous author of "G.P." (London: Blackie & Son. 1939. Pp. 264. 7s. 6d). This unpretentious autobiography of one who is, in the best sense, a perfectly ordinary general practitioner, records his entry into hospital, his training and qualification, and his subsequent every-day thoughts and experiences in practice. Because the author writes with simplicity and sincerity of what he knows, without attempting to improve on the facts his book is quietly effective and absorbingly interesting. Never querulously, and often with humour, he enumerates most of the all too exacting demands made on its general practitioners by modern society. Of the medical curriculum he is both destructively and constructively critical. Thus, like many of us, he would like to see every student destined for general practice provided with greater experience of midwifery. He also advocates compulsory post-graduate study for all who have been in practice long enough to have grown stale. Dr. Ramow looks forward to the era of state medicine which will bring doctors into line with civil servants whose privileges and pensions he envies. These, he thinks, outweigh the tiresome restrictions of the individual which are apparently inseparable from bureaucratic control.

Corrigendum.—Mr. L. F. O'Shaughnessy points out that in the report from our Scottish correspondent (THE LANCET, July 22, p. 217) of his lecture in Edinburgh the last paragraph should read: In one series of 20 cases of cardiac revascularisation 15 patients had angina; of these, 1 died on the table, 1 died from uræmia three months later, and 3 died from heart-failure two months after operation.

BAYER PRODUCTS LTD inform us that their northern branch will be removed on Aug. 4 to new offices at Blackfriars House, Parsonage, Manchester, 3.

ADDRESSES AND ORIGINAL ARTICLES

VISCERAL NEUROSES

BY JOHN A RYLE, M D Lond , F R C P

REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE, CONSULTING PHYSICIAN TO GUY'S HOSPITAL, LONDON

II*

Œsophageal Neuroses

THE two common neuroses of the gullet are heartburn and globus Aerophagy is commoner, but it is a neurosis of swallowing, to some extent controllable by the will, and involving the cooperation of the pharynx It is attended by gastric as well as œsophageal discomforts For these reasons it has been excluded from the present discussion A third and much rarer neurosis is œsophagismus or functional spasmodic dysphagia

HEARTBURN

It is remarkable that the very familiar symptom of heartburn should still stand in want of satisfactory physiological interpretation Payne and Poulton (1923), on the basis of personal experiments with balloons, have associated it with peristaltic activity and a rise in manometric pressure, but the quality of the symptom is unlike the quality of pain or discomfort accompanying clinically or radiologically demonstrable spasm in the gullet itself or in other tubular organs Except in strangury and tenesmus there are few other examples of a burning visceral discomfort It is, however, worthy of note that these two symptoms are *associated* with local sphincteric over action, and that they affect a point of junction between a sensitive and an insensitive mucosa The same is true of heartburn, which, although it may spread higher, is commonly felt in the neighbourhood of the cardia, where the sensitive œsophageal and insensitive gastric mucosæ meet

The older view that heartburn was due to acid stimulation by regurgitated gastric juice also lacks support, as Hurst (1911) has shown, in that it cannot be produced with acids, although it is relieved by alkalis Furthermore, it can occur in patients with normal acidity, hyperchlorhydria, or achlorhydria It has sometimes suffered confusion with acid eructation, which is a separate phenomenon The burning quality of the symptom is quite unlike the ache or more positive pain of colonic or rectal spasm, and it is very different from the pain experienced on swallowing a large bolus or a hard fragment Thus suggests the possibility that the mucosa is the seat of the sensation rather than the musculature, even though there be a minor degree of associated spasm There is no dysphagia or regurgitation of food accompanying heartburn, and it may be momentarily relieved by the act of deglutition—further arguments against any considerable degree of positive muscular overaction The rarity of heartburn in association with organic disease of the stomach or gullet, its frequency as an occasional symptom in otherwise healthy persons under conditions of rush, worry, or injudicious feeding, and as a more persistent symptom in persons of nervous type or faulty habits, or during emotional stress, and also in the later months of pregnancy, all justify its inclusion among the œsophageal neuroses Œsophagitis is an unlikely explanation, for the symptom is not usual in alcoholics, and it is unaccompanied by hawking or regurgitation of mucus or immediate pain on swallowing Radiological studies give negative results

The symptom is described as a "burning discomfort" rather than a "pain" It is felt along the course of the gullet anywhere between the manubrium and xiphisternum but more often at the lower level It may last for seconds, minutes, or longer periods It comes on either immediately or an hour or more after meals but bears a less precise relationship to food than do the organic dyspepsias Some patients relate it to certain foodstuffs, but no single type of food is constantly incriminated Curtailment of starches and fats is often beneficial I have only rarely noted it in association with indisputable allergic phenomena It often accompanies mental anxiety One man repeatedly noticed it after coitus It is temporarily relieved by alkalis, particularly by sodium bicarbonate and aluminium hydroxide The most obstinate types of heartburn are those found in association with the later months of pregnancy and in highly nervous individuals In each of these groups the symptom may cause considerable and prolonged distress In the former it usually disappears completely after parturition

Among 22 cases in which the symptom was sufficiently troublesome to lead in itself to consultative advice there were 13 men and 9 women 5 patients being of Jewish extraction, 1 a Parsee, and 1 a Persian In 10 cases multiple nervous factors were evident without any profound psychological inquiry The following factors were incriminated by 9 patients (1) alcohol, sauces, and afternoon tea, (2) wine, acid fruits, and lobster, (3) bacon and fats, (4) whisky and cocktails, (5) sherry, celery, onions, and kippers; (6) fats, (7) whisky, cheese, pastry, some fats, and Indian tea, (8) wines, condiments, and eggs, and (9) liqueurs, cigarettes, and starchy foods In 7 of the 9 statements alcohol in some form receives mention Among the other substances there is no close conformity One patient, a student, had been smoking forty cigarettes a day In one case a small œsophageal pouch was revealed radiologically, but, although this must have been of long standing, the symptom had been in evidence for a short time only, the patient was an asthmatic and admitted to recent worry

A mild and a severe case are here described

CASE 1.—Male, aged 49 Troublesome heartburn during the past year, felt in the course of the gullet, coming two hours after food, and aggravated by alcohol, sauces, and afternoon tea A well conditioned man, too stout, living rather too well and taking no exercise Nosophobia admitted Reassured and advised to cut out food with afternoon tea, to curtail fats and starches, and to take more exercise Prompt and lasting relief

CASE 2.—Male, aged 72 Chronic heartburn for ten years A Jew much occupied with business, which he discusses at meals Aggravation by wines condiments, and eggs A big starch-eater Holidays formerly brought relief but now do so no longer Symptomatic relief with Jenner's lozenges

In the four cases which follow, as a separate group there were so many associated personal and familial disturbances of a kind generally classified as allergic

* The second Croonian lecture, delivered at the Royal College of Physicians on May 23 1939 Lect I appeared in our last issue

that it is reasonable to inquire whether heartburn should sometimes be regarded as a local manifestation of a more general susceptibility.

CASE 3.—Male, aged 70. For years troubled by heartburn. One physician had diagnosed duodenal ulcer, but the symptom was in no way characteristic, and X-ray examination did not confirm. He was intolerant of vermouth and salt meats and said that "cigars did him no good." The symptom was especially bad every third day and arrived after lunch and between 3 and 6 A.M., when it was sometimes accompanied by hiccups and water-brash. He was lean and nervous and had well-marked factitious urticaria. His mother and a maternal uncle were asthmatic.

CASE 4.—Male, aged 30. Heartburn from the age of 16. The symptom was most in evidence at middle morning, after lunch, and between 6 and 7 P.M. He took alkalis regularly and was very careful with his diet. His previous history included urticaria, hay-fever, and migraine. There was an allergic family history on his mother's side, and one of his children had hay-fever, asthma, and urticaria. His mother was intolerant of eggs. Full radiological and chemical investigations were carried out but did not reveal any evidence of organic disease.

CASE 5.—Female, aged 39. Married, with three children. Heartburn of long standing, which started with her pregnancies. Radiological studies of stomach and gall-bladder gave negative results, and she had been subjected without benefit to a long period of treatment for ulcer. She was also liable to migraine and to bouts of painful rectal spasm lasting twenty minutes. She was suspicious of tea, cream, and rich foods, and admitted to a cancer-phobia.

CASE 6.—Male, aged 26. Always nervous and "stomach-aches" frequent in childhood. A wasted left arm from poliomyelitis. Complained latterly of heartburn, fullness after food, and salivation during and after food. For the past year he had been troubled with repeated attacks of giant urticaria and angioneurotic œdema. The transverse and ascending colon were unduly palpable. His paternal grandfather, one brother, and one sister were asthmatic. He was inclined to blame milk for the angioneurotic œdema. He developed much invalidism but improved after encouragement and a period in hospital.

These allergic histories notwithstanding, it will be seen that in three of the four cases there was a possible explanation in nervous unrest apart from any food idiosyncrasy. I have not encountered heartburn in human anaphylaxis or serum-sickness, and it is not a common association with asthma or cutaneous allergy when these are the presenting symptoms Perhaps the most that can be said at present is that skin tests and food-elimination tests should be more worthy of a trial in obstinate cases of heartburn accompanying accepted allergic phenomena than in cases lacking these associations.

GLOBUS

The relationship of globus, or a sense of "lump in the throat," to emotional disturbance needs no emphasis. It is a common experience in the transient sorrows of childhood and not rare with the greater griefs of adult life. In the nervous patient it is both more frequent and more obtrusive and may of itself become a cause of anxiety by creating a belief in local organic disease. Thus it may both cause and be perpetuated by a nosophobia It is felt below the pomum Adami or retrosternally. It gives the impression of a small globular foreign body lodged in transit It is unaccompanied by pain, dysphagia, or regurgitation. A very similar discomfort is sometimes described in the stomach, the colon, or the rectum by the victims of neuroses affecting these organs, and in the two last-named situations it may be associated with demonstrable tonic contraction of the bowel. It is difficult to avoid the conclusion that a symptom so precise and localised as globus has a physical basis Because it has been called globus hystericus, we are not to suppose that it is imaginary. A slight localised tonic contraction of the œsophageal musculature would best explain it. Such minor changes of tonus in this situation are not as yet susceptible of demonstration by our special objective methods.

Among 7 patients specifically referred for this symptom 2 were Jewish and 1 Welsh; 5 were women and 1 a boy aged fourteen. A brief account of these cases will help to typify related circumstances.

CASE 7.—Female, married, aged 47, of Welsh nationality and nervous. Eighteen months' history of "a lump in the throat," situated behind the sternum, present most of the time but sometimes absent for two or three days. Nervous stresses were liable to cause vomiting On a recent holiday she had felt quite well and happy and lost the symptom. She had a strong cancer-phobia.

CASE 8.—Female, married, aged 43. An emotional type, fond of admiration. Several months' history of a "lump in the lower chest" or epigastrium. No relationship to food. Menopausal irregularity. This patient and her sister both suffered from spasmodic rhinorrhœa.

CASE 9.—Female, married, aged 60. Complained of a feeling of a lump in the throat unaccompanied by pain or dysphagia. Also flatulence with belching, which sometimes relieved the globus. An air-swallower.

CASE 10.—Female, married, aged 45. Globus for nearly a year. A throat specialist, a general practitioner, and unorthodox opinion had been consulted in turn. The symptom had developed in the first instance at a time of great anxiety about a breast tumour, which proved, on excision, to be non malignant.

CASE 11.—Female, married, aged 36. Discomfort and a "choked-up feeling" in the gullet, which led to frequent swallowing. Much depression, domestic overwork, and, in the months preceding the development of the symptom, anxiety about her husband's business.

CASE 12.—Male, aged 36. A worrying nervous Jew. Had complained for four years of a feeling of "a lump behind the breast-bone which made him want to swallow." Business worries and cancer-phobia. His mother had died of cancer.

CASE 13.—An intelligent nervous Jewish boy, aged 14. Had complained for fifteen months of a "lump behind his breast-bone," at first on swallowing only but latterly more persistently. No pain, dysphagia, or regurgitation. Aggravation by excitement and examinations. Sometimes relief with belching. Until the age of 12 he had been troubled with enuresis.

In only one of these cases (case 8) was there an allergic association. In all of them nervous influences were pronounced

SPASMODIC DYSPHAGIA

At one time I included in my index of diagnoses a separate œsophageal neurosis characterised either by pain in the course of the gullet or by a transitory difficulty in swallowing. The association of these symptoms with a nervous temperament and a long history, the intermittency of the attacks, and the negative results of clinical and radiological examinations had seemed to justify the opinion. Achalasia

of the cardia, dysphagia with anæmia (the so called Plummer Vinson syndrome), and an early carcinoma of the cardiac end of the stomach with an initial negative X ray report were familiar to me as differential possibilities Since then improvements in radiological technique have revealed, and papers by Friedenwald and Feldman (1925), von Bergmann and Goldner (1932), and Hurst (1934) have described, a new cause of œsophageal dysfunction in the small intermittent hiatus hernia of the cardiac end of the stomach Reviewing my case-histories in the light of this new knowledge I must now exclude from the functional group several cases originally filed under the heading of nervous œsophageal spasm Here is a case in point

CASE 14 —A woman, aged 69, was troubled during a period of three years by a frequent burning sensation in the course of the gullet, to which were added curious spasms while eating in which "the food would not go down" At times she was compelled to leave the table and bring up food These episodes were sometimes followed by hiccups Radiograms showed a normal gullet A diagnosis of nervous spasm was made, and there was considerable amelioration with a fuller diet, alkalis, and Luminal A later re-examination in special postures revealed a small hernia of the stomach through the œsophageal opening

Cases of this kind can sometimes be recognised clinically by the association of the symptoms with stooping, sitting, or other postures or movements which increase intra abdominal pressure One patient had been told by an observant daughter that she ought always to eat at a "snack-bar" Hiatus hernia can also cause severe substernal pain and may even simulate angina or a coronary thrombosis

After exclusion of all organic possibilities known to us, however, there still remains a small group of spasmodic dysphagias in which nervous factors alone would seem to supply the cause

CASE 15 —A nervous woman, aged 43, after a tiring day was seized with an inability to swallow while eating fish This inability persisted for ten hours, and she could not even swallow fluids or her saliva There was no pain During the previous four years she had experienced the same symptom on several occasions, but it had only lasted for ten minutes or so Eating fish when she was tired had been the chief precipitating factor There was no radiological evidence of œsophageal disease

McGibbon and Mather (1937) have discussed the radiological diagnosis of cases coming within this category.

Among the œsophageal neuroses of constant pattern we may thus include heartburn, globus, and (with careful reservations) nervous œsophagismus or spasmodic dysphagia The organic states which may be erroneously attributed to an œsophageal neurosis are —

(1) Achalasia of the cardia, shown by Rake (1927) to be associated with a degeneration of Auerbach's plexus and invariably accompanied by demonstrable dilatation of the gullet Dysphagia and regurgitation are the main symptoms, but pain may be added when the condition is complicated by secondary ulceration or by œsophagitis Emotional factors can undoubtedly aggravate symptoms in achalasia, although they cannot be claimed as its cause

(2) The dysphagia with anæmia described by Kelly (1930) With this there is associated glossitis, a hypochromic anæmia, and sometimes splenomegaly The dysphagia is at the pharyngo-œsophageal level There is no pain

(3) Intermittent hiatus hernia of the stomach. Dysphagia and sometimes severe pain induced by sitting, stooping, or the reclining posture and relieved by standing, together with a barium X-ray examination in the Trendelenburg position, supply the diagnosis in most cases

In all of these conditions intermittency of symptoms and length of history may at first suggest a nervous disorder, and special methods are needed to complete the diagnosis

In the three neuroses reviewed, diagnosis is based upon the character of the symptoms themselves, the absence of all evidence of organic disease, and a general conspectus of the type and temperament of the patient and of the adverse circumstances of his life, heredity, habits, and environment

Colonic Neuroses

In this section attention will be devoted to those neuromuscular disturbances of the colon which have been variously designated chronic colospasm, spastic constipation, spastic colon, and tonic hardening of the colon In the past these disorders have commonly received the erroneous diagnosis of "colitis" To its most aggravated form, which is characterised by pain and an excessive output of coagulated mucus with the stools, the label of mucomembranous colitis has been applied, but here also, as Hurst (1938) has shown, there is no evidence of a true inflammatory lesion of the colonic mucosa.

A considerable literature has grown up round the subject of spastic colon—the name which I shall, for brevity, employ—and yet the condition continues to pass undiagnosed or to be misdiagnosed and to be treated erroneously in consequence There is probably no other single condition which has led to so much unwise local treatment and to so many needless abdominal operations As long ago as 1906, Hawkins wrote of the intestinal neuroses "They are at this moment particularly worthy of study, owing to the advance of abdominal surgery, not because they are amenable to surgical treatment, but rather because they need protection" This sound advice is still too little heeded

The condition of spastic colon was first described in 1830 by Howship Cherchewsky (1883), Fleiner (1893), Hawkins (1906), Hurst (1910), Turner (1924), and Stacey Wilson (1927) have all added noteworthy descriptions I reported on it myself ten years ago and have paid particular attention to the genesis of the pain which is the most frequent and troublesome symptom (Ryle 1936) My earlier analysis was based on a study of 50 cases For this occasion the notes of 321 cases have been examined This later series included 169 females and 124 males in the "spastic colon" group and 28 female patients in the group with excessive output of mucus, which some would prefer to classify separately under the heading of mucous or mucomembranous colic Of the need for such separation I am not satisfied The smaller group differs only in the severity of symptoms, in the quantity and special character of the bowel discharges, in the greater degree of the nervous instability of its victims, and in the fact that they are almost all women Cases with evident organic disease of the abdominal viscera were excluded from this series, and there were no instances of plumbism

The age-distribution of these cases at the time of consultation is of some interest Into the second decade fell 2 per cent of the cases, into the third 16 per cent, into the fourth 29 per cent, into the fifth 26 per cent, into the sixth 10 per cent, into the seventh 7 per cent, and into the eighth 1 per cent Thus 90 per cent of the patients were between

the ages of twenty and sixty; 74 per cent. between thirty and sixty, and 55 per cent. between thirty and fifty. There is therefore a preponderance of cases in that period of life in which work, anxiety, economic stress, and domestic adjustments are dominant. A similar age-distribution is observed in the cardiac neuroses and in certain organic conditions, notably duodenal ulcer, which seem to be related, at least in part, to anxious temperaments and the nervous stress of modern life. In a random series of 321 consecutive cases (excluding those with spastic colon) 70 per cent. were between the ages of twenty and sixty, 63 per cent between thirty and sixty; and 43 per cent between thirty and fifty.

Of other æthological factors, the case-histories and the sampled statements which follow give a general indication They can convey no adequate idea of the qualitative and quantitative value of the several contributions. Only the most intimate personal histories and after-histories can allow such estimates It need hardly be mentioned that multiple factors of diverse type, but all capable of acting as "irritants," are often recorded in the same case. The patients and their colons are alike sensitive to various forms of adversity. Among the abbreviated entries from the fuller stories taken from my tabulated lists were the following: "fatigue, cold, and worry"; "a Jew, anxiety, worry"; "nerves, worries, pork, salads, fruit"; "alcoholic husband, devoted 'hanger-on,' cancer-phobia, cold"; "death of parents, childless marriage"; and "nuts, fruit, laxatives, worry."

Among the 321 cases a clear history of worry, anxiety, domestic unhappiness, or other emotional disturbance was noted in 188 cases. Fatigue was specifically recorded in 30 cases Cold (with particular emphasis on east winds in several instances) was mentioned in 37 cases. Evident abuse of purgatives, although a much larger number habitually employed them, was mentioned in 13 cases; tobacco excess in 16; aggravation by walking, motoring, or jolting in 14 Of food idiosyncrasies, vegetables, nuts, or fruit were specifically noted in 23 cases and chocolate in 5 There was a history of antecedent dysentery or other acute bowel infection in 9 cases

Of associated neuroses the following were recorded: migraine in 28 cases; asthma in 16; hay-fever or spasmodic rhinorrhœa in 9; œsophageal neuroses in 8; proctalgia in 6; cardiac neuroses in 5; dysmenorrhœa in 5; urticaria in 3; epilepsy in 2; and angioneurotic œdema in 1 case. There were 2 examples each of associated vaginismus, bladder neurosis, and speech stammering. There was a family history of asthma in 14 cases, of spastic colon in 5; of urticaria in 2, and of angioneurotic œdema in 1 case The frequency of all these personal and familial associations may be regarded as an underestimate, for I have only in late years pressed my inquiries in these directions, and in the fullest routine histories patients often omit evidence which does not at the time appear to them relevant or interesting. In a random series of 321 consecutive cases (excluding those with spastic colon) there were 19 cases of migraine, 3 of asthma, and 3 of urticaria

There was a history of appendicitis with operation in 13 cases (4 per cent.). In no less than 86 cases (26 per cent) the appendix had been removed without good historical evidence of appendicitis and commonly for symptoms similar to or identical with those still complained of by the patient I have for some years been at pains to enter "appendicitis" and "appendicectomy" as distinct events in my case-histories. Other operations undertaken for symptoms attributable, so far as could be judged, to the colonic dysfunction were nephropexy, cholecystectomy, hysterectomy, ovariectomy, an exploration, and multiple operations—each in one instance

As illustrative of physical or psychological type, the following adjectives were often encountered in my notes: lean, thin, spare, dark, pale, wiry, anxious, nervous, tense, neurotic Many patients suffered from "dead fingers" in cold weather. Conversely, we find that spastic colon is rarely recorded in fair haired blue-eyed plump healthy complexioned types with good circulation and placid dispositions Its victims are industrious and conscientious and do not, as a class, give way to symptoms unduly or make of them an excuse for invalidism, even though they may appreciate them—as they appreciate their other troubles—more sharply than the common herd Their symptoms are, indeed, very real and often a serious handicap to busy lives

We have evidence for the sensitivity of their colonic mucosa and musculature to local irritants such as nuts, raw fruits, vegetables, and purgatives; to nicotine in some cases; and in many to the general effects of fatigue, cold, and physical jolting But the central, if often submerged, irritations of care, fear, and conscience would seem to play a more important part than any of these Immediate fear can precipitate defæcation in the herbivora or in soldiers before battle. It is not, perhaps, surprising that anxiety, which is a low-grade and protracted form of fear, operating through the preoccupied mind of civilised man, who has learned to inhibit his external display of emotion, should sometimes provoke disturbances of visceral tone and peristalsis In the case of the bowel sometimes pain and sometimes diarrhœa results. A medical man, himself a sufferer from spastic colon, once told me that he knew of no better laxative than an anxious day's work ahead of him. It is repeatedly mentioned by patients that their colonic pain is worse after defæcation, and that they are more comfortable when constipated, so readily with them does tonic action pass into over-action.

Constipation is described in approximately half the cases The remainder have a normal function or bouts of looseness Mucus in the stools is often mentioned In the cases of "mucous colic" there is a true and a spurious diarrhœa, the stools being either loose and frequent or, more commonly, scybalous and frequent. Both in simple spastic colon and in "mucous colic" the dejecta are commonly fragmentary, hard, and likened by the patient to those of sheep or rabbits This fragmentation is but another sign of the tonic and peristaltic over-activity of their intestinal musculature.

Passing now from æthology and associated disorders to the malady itself, we find that the usual complaint is of discomfort or actual pain in some portion or portions of the large bowel. Ascending or descending colon is most commonly indicated (and the gesture may be very exact) with the palm of the hand lying in the course of the affected part in one or other flank or iliac fossa Less frequently the transverse colon is indicated by drawing the ulnar margin of the hand across the abdomen at the "watch-chain" level. In other cases a lower abdominal pain without this precise linear distribution is described. The discomforts are likened to a "ball" a "lump," a "bar of lead" or described as "a feeling of stoppage" The pain is a continuous wearing ache, not rhythmical or griping as in the pain of purgation, enteritis, or intestinal obstruction; and lacking the

immobilising sharper quality and soreness of visceral or peritoneal inflammation It may last for hours and be present day after day Very occasionally, however, colonic spasm comes in acute attacks and may cause pain of great intensity, simulating one of the major crises which signal a stone in the ureter or the bile duct

Physical examination in the chronic type often reveals an unduly palpable colon in one or more of its three accessible parts A contracted colon is often felt in health in the left iliac fossa, but it becomes a more hard and rigid structure in a state of tonic spasm, and in the condition under review it may often be felt in its transverse and ascending portions Shortening and straightening accompany the rigidity In the region of the cæcum these changes may be felt, or even seen in the bath, by the patient himself like a tumour or "cricket ball" in the right iliac fossa The bowel may be tender to palpation and is generally so in the cases of "mucous colic" Radiological examination after a barium meal (the results varying with the state of the bowel at the time) show an intensification of the normal haustrations of the colon, a thin string of barium in the affected portions, or, more rarely, a strictly localised spasmodic constriction The barium enema, usually to be preferred in colonic studies, may in these cases be less informative than the meal as it distends the walls of the gut in passage

Sigmoidoscopy is often difficult and is apt to be unusually painful on account of the spasm The lumen of the bowel can be seen to narrow down to a pin point before the advancing instrument A firm ring contraction is sometimes felt during a digital examination of the rectum

These and other observations leave small room for doubt that the pain is an expression of exaggerated tonus in the bowel musculature. The condition has been called "asthma of the colon," and indeed bronchial and colonic spasm, in their behaviour, chronicity, and intermittency, have much in common, apart from the fact that they may coincide in the same patient or in a family In extreme contraction the colon has been seen on the operating table to become white and hard, and it is not impossible that the attendant ischæmia and anoxia may be the immediate cause of the pain

Relief of pain is obtained by warmth, the hot bottle and hot bath being especially helpful, by belladonna in adequate dosage, but not in every case, and a warm gruel enema, according to Howship (1830), may also bring comfort All these measures tend to counteract spasm In some cases the pain develops late after food and is relieved by food and so prompts a suspicion of duodenal ulcer In most cases sleep is not disturbed, the bodily and mental relaxation seeming to extend their beneficence to the troubled organ

In the differential diagnosis such possibilities as appendicitis, peptic ulcer, diverticulitis, carcinoma coli, ulcerative colitis, intestinal starch indigestion, renal colic, and ovarian or tubal disease may have to be considered In the great majority of cases the history and especially the length of the history, the type and durability of the pain, the temperament of the patient, and a careful examination should lead to a correct opinion Where doubt remains fuller investigation must be employed, and in appropriate subjects carcinoma coli and diverticulitis are particularly to be excluded

Of the erroneous labels which are liable to be attached to these cases chronic appendicitis and colitis are the commonest Both lead to undesirable physical treatments, and both tend to fix the patient's mind unduly on the complaining part of his anatomy The disappointment which follows futile surgery only accentuates his physical and mental misery Here are some illustrative cases

CASE 16.—A highly nervous and anxious professional man, aged 60, was seen in 1932 and 1934 for right-sided abdominal pain He described his cæcum as "blowing up" at times and feeling "like a sausage" He had had a life full of worries and had recently lost his wife after a long illness During the summer and during two holiday periods he lost his symptoms Latterly the pain had begun to wake him at 2 A.M., but he would immediately drop off to sleep after a bromide and belladonna draught He had begun to entertain fears of cancer

CASE 17.—A medical student, aged 21, who gave a history of diarrhœa and vomiting after eating turbot in 1927, of appendicectomy without relief of pain in 1929, and of nocturnal pain with diarrhœa and sickness in 1930, was seen in 1931 for a dragging pain in the right iliac fossa, across the epigastrium, and below the left rib margin He was tender along the course of the ascending and descending colon Two of his brothers had colonic symptoms, and one had been admitted to Guy's Hospital as a case of intestinal obstruction but was found to have an intense spasm only of the descending colon Investigations of the alimentary tract gave negative results Full reassurance and rational treatment were followed by a disappearance of symptoms, and a year later he was reported as in very good health

CASE 18.—A man who had lived in the east for many years but had had no dysentery complained of flatulent discomfort in the right and left iliac fossæ and the epigastrium and of a feeling of "wind in the bowel which would not pass" He stated that fried foods and beef disagreed and that "pork was poison" Symptoms had first appeared ten years previously at a time of great overwork and worry, when his "nerves were bad" He recognised that worry or emotion in anticipation of small troubles was the chief precipitating cause He was lean, nervous muscular, and wiry. His reflexes were very brisk His cæcum at the examination was firm and contracted like a sausage The sphincter gripped the finger during a rectal examination His mother was liable to angioneurotic œdema if she ate strawberries

CASE 19.—Multiple neuroses A young man, aged 26, had had cyclical vomiting in childhood, for many years hay fever, and for one year asthma He was also liable to migraine and was brought to see me partly for these symptoms and partly for "spastic colon" with excess of mucus in the stools In the previous year he had been given a vaccine for the bowel condition and promptly developed an anaphylactic attack, with œdema of the face and dyspnœa, relieved by adrenaline His bowels were erratic and often loose He had observed that he was better without alcohol and when he took exercise His cæcum was bulky, he was lean, and he had a low blood-pressure, but there were no signs of any organic disease

CASE 20.—"Mucous colic" A small nervous undersized married woman aged 35 Seen in 1931, 1932, and 1933 for left-sided abdominal pain constipation, and the passage of much mucus In 1926 she had had her appendix removed and ovarian cysts were said to have been cauterised on account of her symptoms, which persisted Aggravation by cold A cancer phobia also played its part In 1933, after shooting on a very cold day in December, she had a febrile attack with vomiting and diarrhœa, leaving pain again in the transverse and descending colon There was tenderness in the course of the colon, which at times could be felt in contraction under the palpating hand The domestic situation was profoundly

unsatisfactory, for she was unhappily married to a chronic alcoholic whom she could not divorce for religious reasons and was also embarrassed by a devoted admirer.

Now, although, as has been shown, the familiar allergic states are commonly associated with the condition of spastic colon, and although food idiosyncrasy sometimes plays a part, we have scarcely as yet enough evidence to include this particular dysfunction in the allergic category Children with allergy are sometimes stammerers, but it would be an unwarrantable extension of the use of the term to describe stammering as an allergic manifestation. Is there any more reason so to describe the stammering colon? Occasionally, however, cases of acute colonic disturbance are seen in which the arguments for allergy are stronger In these cases the associated phenomena may synchronise with the attack instead of appearing separately and at other times. They may include vomiting, diarrhœa, angioneurotic œdema, and shock-like symptoms. Of such cases I have given an account elsewhere (Ryle 1936). A specific cause or group of causes may or may not be discoverable by careful inquiry and food-elimination or cutaneous tests.

CASE 21.—In a case which has been of great interest to Sir Arthur Hurst and myself, a woman, aged 34, with a strong family history of asthma and hay-fever, and herself liable to hay-fever and digestive disturbances, developed, at intervals, severe abdominal attacks with the following characters: acute lower abdominal pain; a frequent desire to defæcate; the passage of long mucous casts and, in the worst attacks, of much bright blood from the bowel. The sigmoidoscope, however, revealed no ulceration of the bowel, even during active bleeding. Skin tests showed her to be sensitive to pork. She recognised herself as intolerant of pork and eggs. One of the worst attacks started after she had become very cold at a race-meeting and had drunk coffee. When all other measures had failed to relieve the symptoms in a severe attack, Hurst found that 1 drachm of castor oil at night and 1 drachm of sodium sulphate in the morning brought immediate relief.

In connexion with these rare cases of acute hæmorrhagic (non-infective) "colitis" it is worth remembering that Dean and Webb (1924) produced a very similar condition in experimental anaphylaxis in dogs

Rectal Neuroses

Although less frequent than the neuroses thus far considered there is one rectal neurosis so definite in character and circumstance and often so painful that it is a matter for surprise that it has received such scant notice in the literature Under the name of proctalgia fugax Thaysen (1935), apologising for the mixed derivation, drew attention to a painful form of rectal spasm which came on in the absence of any discoverable organic cause and which must long have been familiar to physicians and proctologists.

The usual complaint is of a severe ache—of tooth-ache quality, rapidly crescendo and sometimes reaching an unbearable intensity—which is located in the rectum and sometimes gives the impression that the coccyx is being forcibly bent forwards or backwards The pain may be so bad as to cause pallor and fainting. Its duration is usually from five to fifteen minutes, very rarely longer Although it may also come on in the day, the common account is that the symptom arrives, usually at long intervals, during the night, and especially towards the early hours of the morning. As a rule it bears no relation to defæcation, and in this it is distinct from the pain of rectal carcinoma, anal ulcers, and fæcal impaction. Occasionally, however, it may succeed defæcation. In the early moments of an attack there is a desire to defæcate or to pass flatus, and relief is sought in this way without success. The rectal crises of tabes dorsalis should be readily excluded by a careful history and routine examination of the nervous system Some patients describe a much milder sensation of rectal globus. Proctalgia or rectal spasm has a close association with mental worry and fatigue Colonic spasm is a common accompaniment, and in a minority of cases there is an attendant history of migraine or other allergic disorder. In a group of 15 cases it was associated in 1 with migraine and a family history of migraine and asthma; in 1 with spastic colon and urticaria; in 1 with spastic colon and migraine; and in 6 with spastic colon only. The average age of the patients was forty-five There were 9 females and 6 males In no less than 8 cases a very unsatisfactory or unhappy psychological situation was revealed, or the patients were recorded as of excessively worrying and introspective type One patient recorded great relief from distension of the rectum by immediate inflation with air from a Higginson's syringe Otherwise there is no treatment for the immediate attack, and, indeed, the treatment should correctly be directed to the underlying causes and includes especially the counteraction, when possible, of anxiety and fatigue.

CASE 22.—A masseuse, aged 41, complained of a dull aching pain in the right iliac fossa, which woke her between 2 and 4 A.M. and sometimes lasted all day. She was able to feel a hardened contracted colon on the right side. For some years before this she had been liable to painful cramps in the rectum, lasting up to a quarter of an hour, and occurring both by night and day. There was a history of urticaria following lobster and strawberries. She smoked fifteen cigarettes a day. Family history negative. A firm ring-contraction was felt during a digital examination of the rectum.

CASE 23.—A married woman, aged 46, complained of left-sided colonic pain and of severe nocturnal attacks of rectal spasm, in one of which she fainted. Coitus seemed to predispose. She smoked twenty cigarettes a day.

CASE 24.—A woman, aged 50, was subject to intermittent abdominal attacks characterised by a discomfort "as though food had stuck" and located either in the epigastrium or the flanks At intervals, for many years, she had also been liable to violent attacks of rectal pain, chiefly at night but sometimes in the day. The pain would continue for as much as half an hour. Relief was obtained by inflating the rectum with air.

CASE 25.—A woman, aged 46, complained of "terrible attacks" of pain starting sometimes in the sacral region, sometimes in the vagina, and ending up with a feeling "as though the lower spine were being pushed out" The attacks were mainly nocturnal and would last for a quarter of an hour or even as long as three-quarters of an hour. There was a desire both to defæcate and to micturate. There were varying intervals between attacks, and she might be free for two months. She had had many operations, and the symptoms succeeded the last one, soon after which her husband had been accidentally killed. Her doctor had seen her "writhing in pain" in an attack She was liable to migrainous headaches. Sigmoidoscopy and cystoscopy revealed no abnormality.

CASE 26.—Rectal globus. A young dental surgeon, liable to migraine, and previously seen for lower abdominal pains, complained of a troublesome rectal

discomfort "as though the bowel wanted to move" At first it was associated with standing Later the symptom occurred between midnight and 2 A.M It was in abeyance on holidays There were no signs of organic disease He was over-anxious, had previously had a cancer-phobia and was working very hard and smoking too many cigarettes After reassurance and adjustments in his life, cessation of smoking, and luminal at bedtime he lost his symptoms and gained 9 lb in a month

Vesical Neuroses

The neuroses of the bladder, although commonly considered trivial, are both numerous and familiar Some of them cause much mental distress Precipitate and involuntary micturition is a recognised response to acute fear in man and animals A frightened flock of sheep affords a good demonstration of emotional evacuation both of bowel and bladder The recruit before battle may be unable to contain his urine During the European crisis of September, 1938, I was questioned about a nervous man who was similarly afflicted. The nocturnal enuresis of children, notwithstanding the multiple explanations and physical treatments which have been applied to it, is now generally accepted as a nervous phenomenon, a view which is well supported by its high incidence in the nervous offspring of nervous parents, its aggravation by rebuke and punishment, and its good response to sensible handling and time The diurnal frequency of nervous women, occurring either without evident cause or as a sequel of a departed cystitis, is also common and can generally be distinguished from frequency due to an organic polyuria or pollakiuria by the finding of a normal urine and by the fact that it is in abeyance at night Apprehension of the desire to micturate during social engagements when opportunity is lacking is probably one of the reasons why many women of anxious type restrict their fluid intake unduly In men nervous inhibition of micturition is a familiar experience of the consulting room and the life assurance examination, and there are many who cannot pass water in a public urinal The initial retention of urine which follows abdominal and rectal operations may reasonably be attributed to reflex irritation and inconvenient posture Its persistence is often abetted by anxiety A new and useful remedy in these cases is available in Doryl (carbaminoylcholine chloride)

The more serious nervous incontinences and retentions are comparatively rare and are accompaniments of graver anxiety states Sir James Paget (1879) described the case of a man who developed a nervous retention while walking with a lady friend and declined ever to go walking with her again, because he knew the association of ideas would be too strong for him and would again invite the same disability He also related the case of a clergyman who always passed a catheter before going into the pulpit, because on one occasion, having experienced an urgent desire to micturate during a sermon, he found himself unable to perform the act when the sermon was over

Nervous incontinence may cause misery as great as nervous retention and, in the two cases which follow, complicated other visceral neuroses of emotional origin I have observed no special association between bladder neuroses and the allergic state

CASE 27.—A young woman, who had been liable to gastric and colonic disturbances since childhood and had experienced a few severe attacks of rectal spasm, developed great urinary frequency and was unable to hold her water if she heard a tap running and sometimes, when paying social calls, had urinary incontinence on the door-step A severe psychic trauma had preceded the aggravated phase of this neurosis

CASE 28.—A young married woman, nervous and hypersensitive, at a time of anxiety in connexion with domestic and social affairs, developed diarrhœa and bladder incontinence She also suffered from vaginismus, experienced bowel and bladder pain after evacuation of these organs, and was liable to incontinence in cold weather She was troubled with nightmares always in connexion with lavatories and for a long time was harassed by multiple phobias and anxieties

If we except the acts of blushing and fainting, the conditioned reflex in daily life is, perhaps, better illustrated by the disturbances of micturition than by any other bodily dysfunction Even in good health modifications of natural habit by circumstance are frequent. The old device of turning on the tap to encourage micturition must clearly be related to the environmental associations of the act or to the sound of running water

A physician became aware of a curious conditioning of the desire to micturate After examining a patient in his consulting-room it was his invariable custom to take the specimen of urine to test in his laboratory, carry out the test, and then pass on to the lavatory to wash his hands At this stage, with the taps running, he repeatedly had an inclination to pass water, although he had experienced no desire a moment before As time went by he noted with interest, although he had continued to pay scant attention to the phenomenon, that the reflex had become antedated, and that lighting the Bunsen burner to test the patient's urine now induced the desire

If similar sequences may be held to obtain in the case of the more troublesome visceral over actions —e.g., bronchial and colonic spasm, urinary frequency, and tachycardia—we discover at once an accessory explanation for their chronicity and for their seemingly inconsequent recrudescence independently of any observed external agency or immediate emotional stimulus

Clearly, quite trivial actions and mental associations, conscious and subconscious, are responsible for a great many of man's visceral irregularities and disturbed sensations and may become, in course of time, important determining stimuli. It is a part of the function of general therapeutics and psychiatry to investigate and direct the removal or counteraction of such stimuli

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RESPONSE OF NUTRITIONAL MACROCYTIC ANÆMIA TO ANAHÆMIN

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WE have found that the nutritional macrocytic anæmia seen in Macedonia responds as readily to anahæmin * as to less purified liver extracts, such as Procythol Forte and Campolon.

Wills, Clutterbuck, and Evans (1937) stated that the nutritional anæmia produced in monkeys by faulty feeding, which is regarded as the animal counterpart of nutritional macrocytic anæmia in man, is not affected by the insoluble fraction of the ammonium-sulphate precipitate of whole campolon or by anahæmin. Later Wills and Evans (1938) reported that the nutritional macrocytic anæmia of man in India is likewise unaffected by anahæmin or similar highly purified preparations They postulate the existence of an unknown factor which is active in nutritional macrocytic anæmia and is probably not Castle's extrinsic factor. They suggest that this unknown factor is active in the presence of small amounts of liver principle, either administered with or before it or previously present in the body. According to Castle's hypothesis $\left(\frac{F+G}{I} = LP\right)^{\dagger}$ responses could be obtained in nutritional anæmia by the administration of substances known, or thought to contain, the extrinsic factor. Since, however, Wills and Evans (1938) and Napier (1939) have stated that anahæmin and similar highly purified preparations are inactive in their cases of anæmia, it seems that Castle's extrinsic factor can no longer be regarded as the active factor in the cure of these macrocytic anæmias, and thus, according to their views, Castle's hypothesis is no longer tenable, at least so far as the extrinsic factor is concerned They conclude that, since highly purified extracts such as anahæmin were inactive, Castle's extrinsic factor cannot be responsible for the cure of the nutritional anæmia described by them; hence they assume the existence of some third unknown factor

The typical responses that we have been obtaining with anahæmin seem to bring the position back to that originally postulated by Castle This is further borne out by the complete absence of any response to the administration of large doses of the filtrate-factor concentrates of Edgar and Macrae Case 5 and fig. 5 show clearly that not only were the reticulocytes unaffected by large doses of the filtrate factor, but also the blood-count fell during its administration. Later the patient was given anahæmin, and the reticulocytes rose to 52 per cent. after the sixth dose, and the erythrocytes increased from 800,000 to 2,700,000 in twelve days Work on this factor is still in progress.

Addisonian pernicious anæmia does not generally respond to the administration of Marmite; it does, however, respond to anahæmin and other substances known to contain liver principle, such as campolon. Campolon contains, besides the liver principle, the filtrate factor of Edgar and Macrae (Wills's soluble fraction). By precipitation with saturated ammonium sulphate campolon can be fractionated into two parts: (1) a so-called insoluble fraction, which contains all or most of the anahæmin and anahæmin-like substances, which is active in pernicious anæmia; and (2) a so-called soluble fraction, free from anahæmin and like bodies and inactive in pernicious anæmia but active in nutritional macrocytic anæmia The presence or absence of anahæmin from the soluble fraction depends on the thoroughness of the fractionation, but, if this has been satisfactorily done and a reineckate introduced, there seems to be little possibility of any anahæmin being carried over into the soluble fraction

In our work we have dealt separately with the following substances, the composition and/or liver content of which were understood: anahæmin (B.D.H.); filtrate factor of Edgar and Macrae; Examen (Glaxo); Eluate factor (vitamin B_1); marmite; procythol forte; and varying proportions of a combination of examen and eluate factor. In this paper we are concerned only with our results from anahæmin. Papers in the course of preparation will deal with the other substances.

Anahæmin (B.D.H.) is prepared by the method of Dakin and West and during preparation is completely precipitated with 99 per cent. alcohol, is taken through two ammonium sulphate fractionations and one reineckate. It seems highly improbable that with such a method of preparation any factor corresponding to the filtrate factor of Edgar and Macrae (Wills's soluble fraction) could remain in the final product. We understand that 450 g. of wet liver forms the starting-point of the process of manufacture; this is finally reduced to 150 mg. of solid, which is taken up into 2 c.cm. of tricresol and put up in an ampoule. It follows therefore that the final 2 c.cm. of anahæmin contains the equivalent of 450 g. of original wet liver.

METHOD AND RESULTS OF TREATMENT

The cases with which we were dealing were established as macrocytic anæmia by the following criteria:—

(1) The presence of free hydrochloric acid in gastric secretion, after the injection of histamine or after an alcohol meal, in amounts equivalent to 11–92 c.cm. of decinormal sodium hydroxide per cent.

(2) Mean corpuscular volumes above 100 c.μ., as shown by the Daland and Wintrobe methods, taken at low reticulocyte level.

(3) Price-Jones curves.

(4) Bone-marrow punctures showing typical megaloblasts with finely netted nuclei and hæmoglobiniferous cytoplasm (not to be confused with late erythroblasts with their dense pyknotic nuclei and almost basophil cytoplasm, which are common in many anæmias)

(5) Colour-indices calculated from hæmoglobin estimated spectrophotometrically by the method of Heilmeyer (1933)

The responses to treatment were judged by the daily reticulocyte counts showing expected rise to maximal value, increased numbers of erythrocytes in blood-counts made every fourth day; and profound clinical improvement.

The patients on entering the hospital were given a thorough clinical and laboratory examination, and if they proved to have hyperchromic macrocytic anæmia, with reticulocytes below 5 per cent, they were observed for three to twelve days, during which daily reticulocyte counts were made. If at the end of this period the number of reticulocytes fell or remained stable, the patient was treated till the highest expected reticulocyte response had been

* The anahæmin referred to throughout this paper is that prepared by The British Drug Houses

† F = food (extrinsic factor); G = gastric (intrinsic factor); I = intestinal permeability, or factors influencing it, and LP = liver principle

obtained Treatment was then discontinued, the reticulocytes were allowed to fall to their lowest figure, and a second treatment was started with either the same or another preparation and continued till a second response had been obtained Reticulocytosis unaccompanied by an increase in the number of erythrocytes was never taken as representing a response, for many substances, notably protein derivatives, are known to bring about reticulocytosis Cases which showed constant daily reticulocyte counts varying between 8 and 12 per cent, with some regeneration of erythrocytes, were never included in our series, only cases showing the usual steep rise in the reticulocyte curve followed by regeneration of erythrocytes were selected None of the patients had blood-counts above 2,000,000, and generally we were dealing with counts below 1,000,000

In some cases the patients were treated at once after the period of observation, with anahæmin and kept on this till their reticulocytes had reached the expected maximum Treatment was then stopped, and the reticulocytes were allowed to fall to their lowest value, the patient was then treated with another preparation, and a second response was elicited In other cases treatment was begun with procythol forte, which we know from experience to be highly active in the nutritional macrocytic anæmia in Macedonia, and was continued till the reticulocytes had reached the expected maximum, all treatment was then discontinued till the reticulocytes had fallen to the lowest value, and then anahæmin was given, and a second response was obtained By such means we obtained a response not only when anahæmin was given as the first treatment but also when it was given after a known potent preparation had already produced the initial response The amounts given were 2 c.cm daily for three to nine days, and the maximal reticulocyte response took place about the fourth to ninth day after the start of treatment

We have also treated patients with the filtrate factor concentrate of Edgar and Macrae, and case 5 and fig 5 make it clear that no response whatever can be elicited with this factor Later the same patient was treated with anahæmin, and a characteristic response was obtained Work on this factor is still in progress

It is not intended here to give full details of all the case records We have, however, outlined five typical cases All our patients were females and mostly in the last six months of pregnancy In a forthcoming paper we shall describe cases of hyperchromic macrocytic anæmia in males, which is extremely common here In some of these males

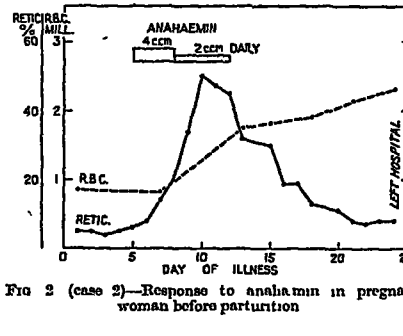

FIG 2 (case 2)—Response to anahæmin in pregnant woman before parturition

typical megaloblasts are found in the sternal marrow, and there is always a great activity of the marrow, nearly all have large spleens and a high indirect Van den Bergh reaction and free hydrochloric acid in the gastric secretion, but none of them respond to intramuscular liver therapy, no matter what preparation is used Apart from the large spleen there is no evidence of malaria in either the bone-marrow or the peripheral blood, but as a routine all such patients are given quinine hydrochloride 2 grammes daily for five days, to ensure clearing up any latent malaria so far as possible There was no sign of abscesses in any of the cases, and the Wassermann reaction was always negative

Information given by the patient about her diet, which we regard as a most unsatisfactory method of ascertaining details concerning dietary, reveals a diet which appears to be adequate in vitamin C, but saturation tests with Redoxon (Roche) show in many cases a considerable deficiency We are aware that in pregnant women the vitamin C stores are likely to be depleted (Teel, Burke, and Draper 1938) but we have found this deficiency also in men So far very little is known about the vitamin C content of the fruits and vegetables in Macedonia, and, since it has been shown that vitamin C content to some extent depends on the condition of the soil, methods of storage, and freshness (Bessey 1938) it is possible that the dietary is not a good index of vitamin C intake in Macedonia So far no data are available for normal levels of vitamin C in Macedonia

Percentage hæmolysis tests, done by the methods of Simmel and Creed and read in the latter case spectrophotometrically, showed that alterations in the resistance of the red cells were not constant We are not, however, at all satisfied with fragility tests as at present carried out and feel that from the quantitative aspect they leave very much to be desired

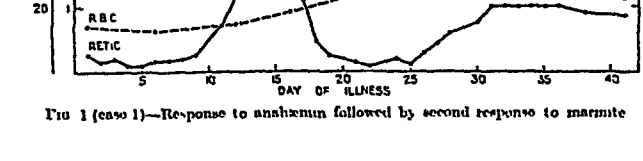

FIG 1 (case 1)—Response to anahæmin followed by second response to marmite

CASE RECORDS

CASE 1 (fig 1).—A multipara, aged 35, eight months' pregnant, entered hospital for weakness and anæmia Well nourished body; spleen palpable Tongue, teeth, and nails normal No œdema of legs, ankles,

or face. Icteric tinge to skin and conjunctiva. Breathless and obviously very ill. Liver normal. Reflexes normal. No petechiæ or history of nose-bleeding or abnormal menses.

Laboratory examination, April 22, 1938 :—

Red blood-cells (R B C) 710,000 (± 3 per cent) per c.mm.	Mean corpuscular volume (M C V) 117 c μ
Hæmoglobin (Hb) 3·2 g per cent (Heilmeyer), 3·3 g per cent (Newcomer)	Mean diameter of approximately 1,000,000 R B C (Pipjer) 8 3 μ
Colour-index (C I) 1·6	White blood-cells (W B C) 4620 per c mm
Hæmatocrit 8·3 per cent.	Reticulocytes 4 per cent.

Bilirubin: direct negative; indirect 1·8 mg per cent
Bone-marrow: low activity; pathological granulocytes, few typical megaloblasts, early and late erythroblasts
Gastric test: free hydrochloric acid after histamine

CASE 2 (fig. 2).—A multipara, aged 30, eight months' pregnant, entered hospital for weakness and breathlessness. Body well nourished. Icteric tinge to skin and conjunctiva. Tongue, nails, and teeth normal; reflexes normal. No petechiæ or history of nose-bleeding or abnormal menses. Liver normal. Spleen II (Hackett). No œdema.

Laboratory examination, Jan. 3, 1939 :—

R.B C 847,000 (± 3 per cent) per c.mm.	M C V 117 c μ.
Hb 3·7 g per cent (Heilmeyer), 3 7 g. per cent (Newcomer)	Pipjer 7·9 μ
C.I. 1·4.	W B C 11,200 per c mm
Hæmatocrit 10 per cent.	Reticulocytes 5 5 per cent
	Bilirubin: direct negative indirect 2 mg per cent

Bone-marrow: moderate activity; many typical megaloblasts; pathological granulocytes, early and late erythroblasts
Gastric test: free hydrochloric acid after alcohol meal

CASE 3 (fig. 3).—A multipara, aged 22, nine months' pregnant, entered hospital for painful spleen and weakness. Body well nourished and plump. Icteric tinge to skin and conjunctiva. No œdema. Teeth, tongue, and nails normal. No petechiæ or history of nose-bleeding or abnormal menses. Reflexes normal. Spleen IV. Liver not enlarged.

Laboratory examination, April 28, 1938 :—

R B C 844,000 (± 3 per cent) per c mm	M C V. 136 c.μ.
Hb 4 g per cent (Heilmeyer), 4 2 g per cent (Newcomer)	Pipjer 8 1 μ
C.I. 1·66	W B C 3080 per c mm.
Hæmatocrit 11 5 per cent	Reticulocytes 5 per cent
	Bilirubin: direct negative; indirect 1·7 mg per cent

Bone-marrow moderate activity; typical megaloblasts, early and late erythroblasts, rare hæmocytoblasts; pathological granulocytes; plasma cells
Gastric test: free hydrochloric acid after alcohol meal

CASE 4 (fig. 4).—A multipara (all dead), aged 30, eight months' pregnant, entered hospital for weakness and œdema of legs. Well-nourished body. Spleen II, very hard. Liver enlarged two finger-breadths and very tender. Nails, teeth, and tongue normal. No petechiæ or nose-bleeding; menses always normal. Skin and conjunctiva very icteric. Reflexes

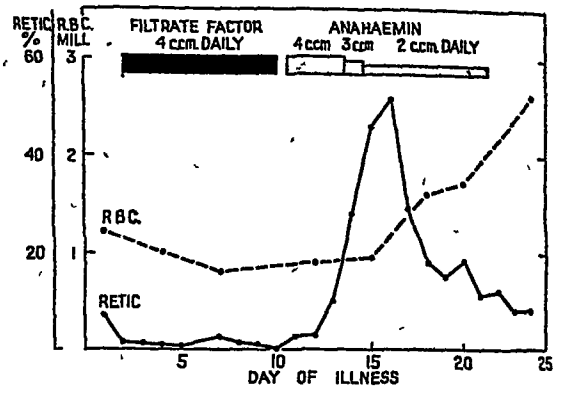

FIG. 5 (case 5)—Failure to respond to filtrate-factor concentrate followed by response to anahæmin.

normal. Conspicuous jugular pulsations Patient breathless and very ill.

Laboratory examination, June 15, 1938 :—

R B C 975,000 (± 3 per cent) per c mm	M C V. 103 c μ
Hb 3 7 g. per cent (Heilmeyer), 3 8 g per cent (Newcomer)	Pipjer 7 8 μ
C.I 1 3	W B C. 3800 per c mm
Hæmatocrit 10 per cent	Reticulocytes 4 per cent.
	Bilirubin direct negative, indirect 2 5 mg per cent

Bone-marrow: small activity, early and late erythroblasts, pathological granulocytes, very rare megaloblasts
Gastric test: free hydrochloric acid after alcohol meal

CASE 5 (fig. 5).—A multipara (thirteen children), aged 40, seven months' pregnant, entered hospital for weakness and dyspnœa. Well nourished, with very slight icteric tinge to skin and conjunctiva. No œdema; tongue, teeth, and nails normal. No petechiæ or history of nose-bleeding or abnormal menses. Reflexes normal. Spleen I; liver enlarged three finger-breadths and tender under epigastrium.

Laboratory examination, Feb. 28, 1939 :—

R B C 1,178,000 (± 3 per cent) per c mm	M C V 127 c.μ.
Hb 4 5 g. per cent. (Heilmeyer).	Pipjer 7 7 μ
C.I. 1 3.	W B C 2760 per c mm.
Hæmatocrit 15 per cent.	Reticulocytes 1·8 per cent
	Bilirubin direct negative; indirect 1 mg per cent.

Bone-marrow · typical megaloblasts; early and late erythroblasts, pathological neutrophils and plasma cells, very active marrow
Gastric test: free hydrochloric acid after alcohol meal

DISCUSSION AND SUMMARY

Nutritional macrocytic anæmia, as seen in Macedonia, responds as readily to highly purified preparations, such as anahæmin, as it does to the

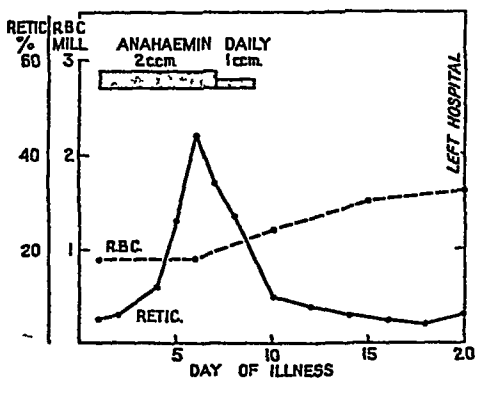

FIG. 3 (case 3)—Response to anahæmin in pregnant woman before parturition

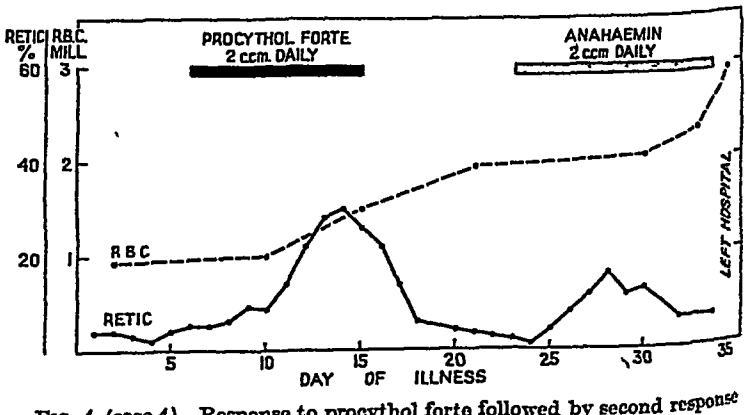

FIG 4 (case 4)—Response to procythol forte followed by second response to anahæmin.

cruder liver preparations, such as procythol forte and large doses of campolon This response to anahæmin in Macedonia is in contrast to the cases treated in India and suggests that the Macedonian cases differ from those in India, where a high indirect Van den Bergh reaction is rare, glossitis is common, and the highly purified liver preparations are inactive Such responses to these highly purified extracts make it appear unlikely that the filtrate factor of Edgar and Macrae is the active one in the cure of nutritional macrocytic anæmia in Macedonia

Further, work done with the filtrate factor concentrate shows that this, administered alone, is inactive even when given in large doses The case-records given here show that during treatment with this substance not only did the reticulocytes not increase but also the blood count fell Later the patient responded to anahæmin with a maximal reticulocytosis of 52 per cent followed by regeneration of the erythrocytes

It is not impossible that the response to anahæmin is quantitative and related to the liver content In this respect it is interesting to note that responses to campolon, which contains the equivalent of 10 g of wet liver per 2 c cm , can only be obtained if very large doses (8–12 c cm daily) are given, and that procythol forte, which contains the wet liver equivalent of 100 g , is active in 2 c cm doses Anahæmin is active in 2 c cm doses and will probably be found active in smaller doses

Although the quantitative aspect is important, it is probable that the qualitative aspect also enters into the picture, for work now in progress seems to show that large amounts of filtrate combined with very small amounts of anahæmin are extremely active

This work suggests that the conclusions drawn by Wills and Evans (1938) and Napier (1939) do not apply to the nutritional macrocytic anæmia as seen here, for we obtain typical responses to anahæmin Further, the suggestion that there is *some active* principle present in the filtrate *factor is not* borne out by work with filtrate factor concentrates, which do not produce any effect on the anæmias here Such findings appear to bring back the position to that originally postulated by Castle

The regeneration of the blood in our cases is not always adequate, and we consider that this is probably due to an intercurrent destruction of blood, which may also be responsible for the relatively large doses of liver extract required In this connexion we think that doses effective in pernicious anæmia are not necessarily any guide to what may be adequate doses in nutritional anæmia The large spleens often present in our cases and the relatively high Van den Bergh reactions may suggest that underlying malaria and hypertrophy of the reticulo endothelial system may also be a factor in the large doses required, but we have no evidence that smaller doses are beneficial in cases with low indirect bilirubin values and small or non palpable spleens

A hyperchromic macrocytic anæmia, associated with large spleen, very active marrow, which occasionally contains megaloblasts and free hydrochloric acid in the gastric secretion, is very common in males in Macedonia and, so far as we can at present ascertain, responds to no intramuscular liver preparation that we have so far tried

Some of our cases both in males and in females, show vitamin C deficiency after saturation tests with redoxon (Roche), although from a history of the patients' dietary no vitamin C deficiency would have been suspected

We have recently carried out an anæmia survey in the island of Cyprus and have been extremely surprised to find that the predominant anæmia there is hypochromic microcytic in contrast to Macedonia, where the predominant anæmia is hyperchromic macrocytic The dietary survey showed that there were considerable differences between the consumption of meat in Cyprus and that of Macedonia, in the former more meat being eaten, there is a low consumption of green vegetables in Cyprus compared with Macedonia A full report of our Cyprus findings will be published later

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TREATMENT OF EPILEPSY WITH EPANUTIN

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In experiments on animals Putnam and Merritt (1937 and 1938a) investigated the anticonvulsant properties of many drugs, and found that sodium diphenyl hydantoinate was a strong anticonvulsant and weak narcotic Later they tested it on human beings (Merritt and Putnam 1938b) with good results, and the drug has since been marketed as Dilantin in America and Epanutin (Parke Davis) in this country Apparently it is now used fairly widely, but no publication other than that of Merritt and Putnam (1938b) has yet dealt with any large number of cases

The material used in our own investigation consisted (like Merritt and Putnam's) of chronic cases male cases at Cane Hill and Warlingham Park mental hospitals and female cases at Warlingham Park only, making a total of 53 male and 22 female The cases were unselected except for the exclusion of a few patients too feeble to warrant a change from their usual sedatives They were all subject to grand-mal attacks, and the investigation was limited to this form of fit alone, for the difficulties in determining the number of petit mal attacks in this type of patient were such as to render accurate conclusions impossible, and such attacks were rare Of our 75 patients 58 have been treated continuously for two to six months, and 52 of these more than three months In 11 cases it has been necessary to terminate treatment and 6 recently admitted patients have not yet received two months' treatment

Merritt and Putnam's 118 patients with grand mal, of whom only 59 were free from petit mal or what they term "epileptic equivalents," had received treatment for more than two months and most of them for less than six months They had previously been treated with bromides or with phenobarbitone and so had most of ours, with the addition of chloral or Prominal in a few cases

The object of our investigation was to determine the anticonvulsant effect of epanutin as compared with other anticonvulsants, such as bromide or phenobarbitone; whether any mental effects were produced by the drug; its *toxicity*; and the best method of change-over to this form of treatment

ANTICONVULSANT EFFECT

Our findings confirm those of Merritt and Putnam—namely, that the drug is a strong anticonvulsant, its action sometimes being dramatic. Table I shows our results in detail and table II compares Merritt and Putnam's figures for grand mal with *ours* As regards complete remissions our figures do not equal those of Merritt and Putnam who, however, do not state the period over which complete relief was obtained, and our material was probably more chronic

TABLE I—EFFECT OF EPANUTIN ON NUMBER OF EPILEPTIC FITS

Case no.	Previous medicine	Final dose of epanutin	Months on epanutin	Total fits for corresponding length of time as epanutin in the preceding 3 years and immediately before				Number of fits while on epanutin
				1936	1937	1938	Immediate previous period	
1	L gr ½ t d s	3	6	384	528	524	256	71
2	L gr 1, B gr 7½ t d s	5	3	213	43	92	91	23
3	B gr 20 t d s ..	4	5	49	26	23	31	11
4	L gr 1 t d s ..	3	6	55	26	35	64	11
5	B gr 30 b d ..	4	4	12	9	25	26	11
6	B gr 20 t d s, P gr ½ n	4	6	123	89	89	123	9
7	B gr 15 t d s .	4	4	17	24	25	23	16
8	Nil ..	3	5	41	40	52	89	25
9	B gr 20 t d s ..	4	4	17	24	25	14	16
10	L gr ½ t d s ..	3	3	55	37	24	48	6
11	B gr 15 t d s. ..	3	6	171	126	92	131	8
12	B gr 20, C gr 10 t d s.	3	3	213	43	92	13	23
13	L gr 1½ b d ..	3	3	22	20	11	4	15
14	L gr 1½ b d .	3	3	40	15	28	25	13
15	L gr 1 b d ..	3	3	15	11	3	13	10
16	L gr 1½ b d .	4	3	7	14	11	6	7
17	L gr 1½ b d ..	4	3	16	12	12	4	16
18	L gr 1½ b d. .	4	3	17	11	10	11	14
19	L gr 1 b d .	3	3	8	7	2	6	6
20	L gr 1 b d .	4	3	15	15	19	11	22
21	L gr 1½ b d .	3	3	6	6	7	6	11
22	L gr 1 b d ..	2	3	0	0	0	0	0
23	L gr 2 t d s.	4	3	18	15	5	4	3
24	L gr 2 b d	4	3	25	17	19	18	20
25	L gr 1 b d ..	4	3	19	17	23	7	30
26	L gr 1 b d .	4	3	2	1	1	0	8
27	L gr 1 n .	3	3	0	0	0	0	10
28	L gr 2 b d .	3	3	56	34	28	26	20
29	L gr 1½ n	4	3	8	6	8	8	7
30	B gr 10 b d ..	3	3	3	9	9	3	7
31	L gr 2 b d	4	3	13	7	32	16	18
32	L gr 1½ n .	3	3	6	5	11	3	3
33	L gr 1 t d s. ..	3	3	0	0	0	2	3
34	L gr 2 b d .	4	3	.		8	7	10
35	L gr 1 t d s .	4	3	.		.	28	17
36	B gr 10, C gr 10 t d s	3	4	..	.	26	24	5
37	P gr 3 n . .	4	3	.	29	17	52	9
38	B gr 10 t d s .	3	2		..	.	6	8
39	B gr 15 t d s .	2	3	.	..	46	7	4
40	B gr 15 t d s, P gr ½ n	4	5	..	33	39	13	24
41	L gr 1 b d ..	3	5	.		20	28	5
42	L gr ½ b d, B gr 15 t d s	4	5	96	56	86	107	59
43	B gr 30 t d s, L gr ½ b d	6	5	74	68	95	134	48
44	B gr 15, L gr ½ t d s	3	5	49	7	22	21	13
45	L gr ½ t d s .	4	5	53	46	75	57	33
46	B gr 15 t d s ..	3	5	29	19	42	39	13
47	B gr 20, L gr 1 t d s	3	2	13	1	20	26	0
48	B gr 15, L gr 1 t d s	3	2	31	40	30	22	13
49	Nil .	3	2	7	9	6	14	4
50	L gr 1½, B gr 20, C 5 t d s	6	4	..	..		190	23
51	B gr 15, P gr 3 t d s, L gr 1½	4	4	..	..		279	41
52	Nil .. .	3	3	..		.	.	5
53	L gr ½ t d s	3	4	..	..			7
54	L gr 1 t d s	3	4	.	.	.	1	0
55	Nil . ..	6	2	.		.		6
56	Nil . .	3	5	28	35	87	102	221
57	L gr 1 t d s	3	2		..	.	..	1
58	B gr 10 t d s .	3	3	.	.	.	2	0

B = bromide; C = chloral; L = luminal, P = prominal; n = nocte.

TABLE II—EFFECTS OF EPANUTIN ON GRAND MAL IN THE PRESENT SERIES COMPARED WITH RESULTS OF PUTNAM AND MERRITT

Effect on frequency of attack of grand mal	Merritt and Putnam's (1938b) series (118 cases)	Present series (58 cases)
Complete relief ..	29 (49·1 %)	23 (39 6%)
Great decrease ..	14 (23 7 %)	12 (20 6%)
Moderate decrease ..	6 (10 1 %)	5 (8 6%)
No change	10 (16 9 %)	4 (6 8%)
Increase . ..	Not mentioned	14 (24 1 %)
Total	59	58

Putnam and Merritt do not state exactly the meaning of their terms We have adopted the following criteria —

Complete relief=no fits during last six weeks.

Great decrease=reduction by more than a half
Moderate decrease=any reduction smaller than a half.
} Compared with a similar period before treatment

than theirs Both in our series and in theirs the period of observation was comparatively short, as they remark, "it is probable therefore that many of the patients in the completely relieved groups will later be transferred to other groups, but it is possible that greater experience with the use of the drug will *make it possible to obtain better results* in some of the cases in the moderately or greatly improved groups."

The criticism may be offered that certain of our patients having a large number of fits were being inadequately controlled before the treatment with epanutin. Most of them, however, had been under observation for many years and, after a trial of various drugs and different doses, had been given that most suited to them. Similar great reductions in the number of fits are instanced by Merritt and Putnam, who cite a patient having two or three fits a day on luminal gr. 6 who was completely relieved of attacks from the start of treatment with dilantin; and by Coope (1939), who mentions several cases of multiple fits much reduced by epanutin. Table I shows that some patients had few fits before epanutin was given; these have been included to illustrate the efficiency of epanutin as compared with that of the previous medicine in keeping their fits down.

The anticonvulsant effect of epanutin is recorded graphically in 3 separate cases in fig. 1. In the 51 patients on treatment for over two months the total number of fits a month are recorded in fig 2, which shows the reduction under epanutin as opposed to previous medicines. In certain cases the number of fits increased immediately after the change of treatment, but was later reduced without the dose being increased. This appears to be important, for, if it is not recognised, a false idea of the controlling action of epanutin may lead to its discontinuance In 3 cases, at first well controlled with epanutin, there was a sudden bout of fits in rapid succession four to six weeks after the treatment had been started which led to withdrawal of the drug. In 1 patient, at first well controlled, status epilepticus developed after he had been on epanutin for four months

Merritt and Putnam have described cases in which epanutin did not control the fits so well as other sedatives In our series 14 patients had an increase of fits, although mostly only slight Sometimes, in spite of the fits being controlled, the occurrence of auræ tended to persist and the patient appeared to be more conscious of these than previously

MENTAL EFFECTS

Apart from the reduction in the number of fits, there is little doubt that epanutin is beneficial to the mental condition of many patients The patients being chronic psychotic epileptics, there was little room for intellectual improvement, but a beneficial modification of the typical epileptic temperament was often observed From our observations and those of the nursing staff we are convinced that up to the present most of the patients have improved mentally, being more cheerful and congenial, less quarrelsome and complaining, and more easily managed and occupied In some cases the effect has been remarkable One patient, who was being treated with phenobarbitone and was in a semi stuporose condition, is now completely relieved of both fits and stupor, and another patient, who was so aggressive that his relations feared to visit him, now enjoys Sundays at home with them Detrimental changes may, however, develop in association with toxic effects, and whenever a patient's mental condition appears worse chronic poisoning should be suspected

TOXICITY

The question of the toxic action of epanutin is one of great importance A note of caution has already been sounded by Schlesinger (1938, 1939), who also points out the chemical resemblance between epanutin and Nirvanol (Poynton and Schlesinger 1929) and refers to his own experience of the toxicity of nirvanol Lennox (1938) maintained, however, that epanutin cannot be considered in the same category as nirvanol with regard to toxicity

Merritt and Putnam (1938b) noted the following toxic symptoms (1) slight giddiness, ataxia, tremors, blurring of vision, and diplopia from the third to tenth day in 15 per cent of cases, (2) various erythematous, morbilliform, and scarlatinal rashes, and (3) more serious skin lesions and changes in the blood on the ninth and tenth days, including one case of exfoliative dermatitis and one of purpura They found that reduction of the dose alleviated the first

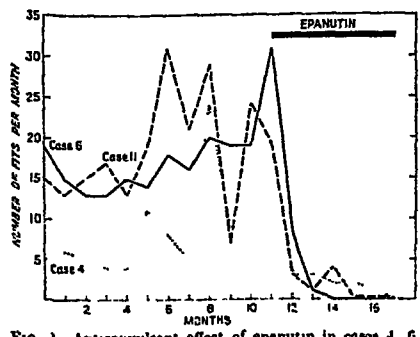

FIG 1—Anticonvulsant effect of epanutin in cases 4, 6 and 11 (see table I)

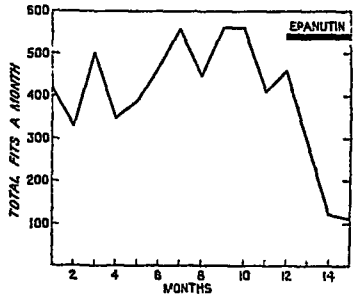

FIG 2—Total number of fits a month in 51 epileptics before and during treatment with epanutin

two groups of symptoms, and that the dose could usually be increased later without causing a renewal of the symptoms

Epanutin.—The incidence of nervous and mental symptoms in our cases was as follows —

Giddiness	4	Hallucinations	3
Tremor	3	*Prolonged confusion*	3
Ataxia	4	Clonic spasms	2
Blurring of vision	1	Much agitation	2
Diplopia	0	Mental depression	2
Slight nausea	3	Reactivation of suicidal tendencies	1
Delusions	3		

These figures do not represent the number of patients showing toxic symptoms for two or more symptoms often developed in the same patient

These symptoms, except the first five, are not described by Merritt and Putnam (1938b) There seems little doubt that they were due to toxic effects, for they had seldom been present before the start of treatment with epanutin and, if so, only in a mild form, and when the drug was withheld they disappeared The resemblance of these mental symptoms to those described by Willcox (1927) lends added probability of their toxic origin, for this drug has much in common with the barbiturates as regards toxic effects on the nervous system

Although most of the nervous complications in our cases developed during the earlier days of treatment they were not confined to the first ten days like those described by Merritt and Putnam Three patients who appeared normal during the first few weeks of treatment later developed attacks of confusion that were more severe and prolonged than those experienced on their previous medicine That this was due to too much rather than too little epanutin is shown by the fact that an additional capsule exaggerated the symptoms and produced a reeling gait Subjective sensations—e.g. difficulty in seeing and stiffness of the jaw—and clonic spasms of various muscles developed in certain cases A severe skin reaction was seen in only one case, a man who had an attack of acute bronchitis and coryza on the fourth day of which he developed a morbilliform rash followed shortly by pyrexia The absence of Koplik spots ruled out the diagnosis of measles and the symptoms corresponded very closely to those caused by nirvanol

Merritt and Putnam found no abnormality in their patients' blood and most of ours revealed no change, although an occasional leucopenia with a relative lymphocytosis was found; but we do not attribute these changes to the drug, because Patterson and Wingrow (1929) found similar changes in

idiopathic epilepsy. This change has been described in association with nirvanol. Although albuminuria has not been found, an alkaline reaction has been noted in specimens of urine collected before meals and most often in morning specimens. No blood-pressure changes attributable to epanutin were found. Sponginess of the gums resulting from this drug has been described by Kimball (1939) Our hospital dentists, however, could find it in only two cases in which it could be in any way attributed to the drug.

It is convenient here to mention a patient (case 35) who, although previously having an average of ten fits a month, had no fits for ten weeks on epanutin and showed much mental improvement, willingly employing himself and being altogether more pleasant. Recently, however, he has had a bout of confusion more prolonged than ever before The question therefore arises as to the benefit of producing a complete cessation of fits in all epileptic patients.

DOSAGE AND CHANGE-OVER

The avoidance of toxic effects, the best method of changing from previous drugs to epanutin, and regulation of dosage are three important matters The change-over from luminal or bromide to epanutin requires care; to find a standard method we divided the cases into three groups, completing the change rapidly in the first, less rapidly in the second, and slowly in the third In group 1 one capsule (0 1 g) of epanutin was substituted for a dose of luminal or bromide, regardless of the quantity of that dose, and in groups 2 and 3 the change was effected on the basis of 0 1 g. of epanutin to each 0 1 g. (gr. 1½) of luminal or gr. 15 of bromide or chloral In group 1 one capsule was substituted for one dose of the previous medicine until on the third day a complete change was effected, so that patients who had been receiving their previous medicine three times a day were now receiving only one capsule of epanutin three times a day In groups 2 and 3 longer intervals were allowed before the second and third capsules were given. It was found that nearly every case required a minimum of one capsule three times a day, no matter how small a dose of the previous medicine had been taken. No difference in toxic effects or ability to control the fits was noted in the three groups. Some cases required later additional capsules, the maximum we have given being six capsules in the day Patients who require a large amount of bromide or of luminal to control their fits usually require a large dose of epanutin (see table I, cases 42 and 50), although no definite correlation can be established

In some cases there appears to be little relation between the previous dosage and the amount of epanutin required to produce a corresponding control of the fits. This is illustrated by two cases; one patient, who was in a state of semi-stupor on gr ½ of luminal thrice daily, had his stuporose condition and fits completely relieved by epanutin 1 capsule thrice daily, and the other patient, an epileptic who had been kept free from fits with gr. 1 of luminal at night, began to have fits and to be confused when he was given epanutin 1 capsule each day.

The individual response to epanutin appears to be variable, some cases responded miraculously to three capsules in the day, whereas others required a toxic dose to reduce their fits In most cases a standard controlling dose was soon reached, but in some cases the fits increased several weeks later, as already described, suggesting that there might be decreased tolerance or late toxic effects

The method of substitution which we have now adopted is to replace one dose of the previous drug with one capsule of epanutin every other day until on the sixth day the patient is having epanutin alone. If the patient is on four doses of the previous medicine, this dose is omitted on the eighth day Thereafter, unless there is an increase of fits, a larger dose of epanutin is not given until after the fourteenth day, for it is mostly during this time that toxic symptoms appear. In some cases fits tend still to continue at night when the capsules are given three times a day before meals as advocated, and it is then necessary to give the third capsule later in the day or to add another capsule before bedtime.

CASE-RECORDS

CASE 35.—Male, aged 37. Past treatment: sodium luminal gr. 1 thrice daily (t d.s.). Past fits a month: 10, 7, 11, 9, nearly all nocturnal. Mentally dull with a typical epileptic temperament with frequent complaints and suspicion. Epanutin started March 9, 1939, and thereafter fits a month were 15, 1, 0, 0. Mentally much improved, being more cheerful.

May 13: onset of persistent confusion, which increased gradually, although he was less suspicious and aggressive than in previous confusional attacks. This attack of confusion was more prolonged than any he had had while having fits. The desirability of eliminating fits entirely is thus questioned.

CASE 60.—Male, aged 60. In hospital since 1914, on luminal gr. 2 twice daily (b.d.) Past fits a month: 0, 2, 2, 0, mostly diurnal. Mentally childish, self-satisfied, and religiose. Epanutin started on March 16, 1939, 1 capsule t.d.s Subsequent fits a month, 2–5. No mental change noted.

April 11: sensation of uselessness of right arm. Disappeared by next day. May 1: sensations of impaired vision, stiffness of jaw, and a feeling of being gassed Epanutin stopped and luminal given. May 2: improved and back to his previous mental condition.

CASE 56.—Female, aged 39. Ten fits a month with bromide. Epanutin started on Jan. 10, 1939, 1 capsule b.d., increased to 1 capsule t.d.s Fits persisted but fewer until in May only one fit until the 20th, when sudden onset of status epilepticus, which was controlled by paraldehyde per rectum.

CASE 36.—Male, aged 28, average fits a month 6 Epanutin started on Jan. 31, 1939. Fits controlled, but exactly seven days after starting epanutin the patient developed acute bronchitis. Coryza and a morbilliform rash appeared on the trunk on the tenth day and spread to the limbs. The temperature rose during the next few days to 105° F., and the patient became stuporose. The cerebrospinal fluid and urine were normal, but there was a mild leucopenia (white cells 4800) with a relative lymphocytosis. Epanutin was stopped, and the patient made a slow but steady recovery. Epanutin was again given cautiously with no further untoward symptoms.

CASE 52.—Female, aged 41. Epanutin started on Jan. 31, 1939. Two weeks later she complained of giddiness, and a week later was stuporose and pale and had a weak and thready pulse Blood and casts were found in her urine. Although she was only having three capsules of epanutin a day, the nephritis was considered to be due to the drug, which was discontinued, whereupon the condition rapidly subsided.

CONCLUSIONS

Our conclusion that epanutin is a strong anti convulsant with a proportionately small depressant effect confirms Merritt and Putnam's work Our results regarding the reduction of fits are not so good as those obtained by them, but this may be due to the chronicity of our cases The development of late toxic symptoms has not been sufficiently emphasised by them, and we have no evidence that at even a

later date other toxic symptoms may not appear We agree with Merritt and Putnam that this drug is more toxic than many other of the common anti convulsants and emphasise the apparent idiosyncrasy to its action and the necessity for caution in its use

SUMMARY

(1) An investigation was undertaken to ascertain the action of sodium diphenyl hydantoinate (epanutin) on a large series of epileptics (53 male and 22 female) in mental hospitals

(2) The anticonvulsant properties of epanutin were confirmed and compared with those of luminal, prominal, bromide, and chloral The action of epanutin was superior to that of these drugs in many cases, but in others it appeared to be inferior

(3) Mental improvement was observed in most of the patients, the typical epileptic temperament being considerably improved and the patients becoming more congenial and more easily nursed and occupied

(4) The importance of the toxic action of this drug is emphasised Many cases exhibited toxic nervous symptoms, but only one developed a rash These toxic symptoms often developed after an increase in the dose

We are indebted to Drs G A Lilly and T P Rees, medical superintendents of Cane Hill and Warlingham Park mental hospitals respectively, for permission to publish this paper and for the interest they have shown, and to Mr N B Coltart and Dr G Lyle, dentists at the two hospitals respectively, for their opinions

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EPANUTIN IN EPILEPSY

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Merritt and Putnam, in their article on the treatment of convulsive disorders,[1] conclude that the use of sodium diphenyl hydantoinate (known in this country as Epanutin) should be restricted for the present to "that group of patients which does not respond to the less toxic forms of therapy in common use" Practically every epileptic of any length of standing has been subjected to most of the drugs used to depress excessive nervous excitability, and what is satisfactory in one case repeatedly turns out to be of little or no use in most In dealing with the epileptic without mental deterioration it must never be forgotten that, though the benefit from a drug may be due largely to its sedative effect, the psychological value of a new treatment in which the patient is educated to have faith has to be considered, it is therefore somewhat difficult to assess the real value of any drug For this reason it has seemed desirable to deal with a series of cases of long standing and known degree of convulsive seizures in which there may be fairly said to be sufficient epileptic deterioration to discount the psychological aspect of any treatment, it has been possible to do this at Smithdown Road Hospital, Liverpool, over a large number of cases, of which 20 have been selected for report

Coincident with the treatment of "chronic" epileptics, epanutin has been used on the more acute or less deteriorated cases, and a further report will be submitted at the end of continuous observation on the value of the drug in such cases

TREATMENT

We expected that the most that epanutin could produce was an amelioration in, and a reduction of, the number and severity of the seizures in some cases A true comparison of its probable value seems to demand that the epilepsy be of long standing, and that long periods of observation and careful records should be available to contrast with the results obtained with other drugs The 20 cases selected fall into the following classification of observation —

Ten years or over	3
Five to ten years	7
Two ,, five ,,	7
Under a year	3

Continuous notes have been kept of the seizures under all the drugs used and of the patients' social and mental conditions In the accompanying table the average number of fits can be taken as a fair indication of the condition on admission In certain cases all treatment was withdrawn some time after admission but the length of time allowed to elapse between the changing of medication is quite sufficient to ensure that there were no residual effects of previous drugs

Cases 18 and 20 have not the same period of observation that the others have, but they have been included as being established epileptics with a long history of varied treatments outside Case 10 shows the result of therapy with epanutin alone

Treatment of epilepsy with any drug is based on finding the minimum which will control the seizures, and this has been attempted in all the cases instanced From time to time the dose has had to be varied, but gr 15 of potassium bromide twice daily is an average, Prominal gr 1½ has been taken as the minimal dose and increased up to gr 4½ as a maximum, and Luminal gr 1 twice daily has been given in solutions, and this has rarely been exceeded, the solution being freshly prepared daily Endeavours have been made to time the giving of drugs in anticipation of any known time incidence of seizures

RESULTS

The accompanying table seems to uphold the statement that epilepsy reacts in different ways to different drugs, and that no drug can be considered specific, nor is any one certain to act in most cases when given in reasonable therapeutic doses It is obvious that, where the standard dose is safely exceeded, the depressing effect may readily keep the seizures below the ordinary normal limit, with perhaps a consequent physical reaction to the detriment of the patient in general

Merritt and Putnam show over a very large series of cases that of the major epileptics treated with the drug under its American name of Dilantin 58 per cent

1 Merritt, H H and Putnam T J *J Amer med Ass* 1938 111 1068

COMPARISON OF TREATMENT OF EPILEPSY WITH EPANUTIN AND OTHER DRUGS

Case	Age	Period of observation	Average no of fits a month without treatment	Monthly average of fits under treatment with—					Complication of epanutin therapy
				Bromides	Luminal and bromides	Luminal	Prominal	Epanutin	
1	32	20 yrs	30	11*d*	12*e*	25*e*	—	22*b*	—
2	32	10 ,,	39	32*d*	32*e*	28*e*	36*c*	2*b*	FF
3	50	10 ,,	21	12*c*	20*d*	16*e*	—	4*b*	B, D
4	28	8 ,,	30	24*e*	60*e*	24*d*	20*c*	13*c*	A
5	28	8 ,,	60	—	88*e*	28*e*	36*b*	34 {12 major, 22 minor *b*	EE, D, FF
6	36	6 ,,	31	24*d*	32*d*	24*e*	—	21*b*	D, EE
7	28	6 ,,	20	12*c*	5*e*	13*e*	21*b*	14*c*	—
8	27	6 ,,	10	7*a*	—	12*e*	—	6*a*	—
9	37	6 ,,	30	—	36*e*	16*e*	26*b*	20*a*	D
10	39	5 ,,	8	—	7*a*	18*e*	—	6*a*	F
11	34	4 ,,	20	21*a*	37*e*	20*e*	14*b*	20*a*	—
12	21	3 ,,	25	—	23*b*	10*d*	19*a*	14*a*	—
13	26	2 ,,	19	28*d*	36*e*	32*c*	28*a*	26*b*	DD, E, F
14	27	2 ,,	82	—	88*b*	48*c*	68*a*	70 {35 major, 35 minor *b*	B
15	46	2 ,,	30	—	3*e*	28*e*	—	38*b*	B, DD, F
16	36	2 ,,	10	5*a*	—	15*e*	—	—*a*	—
17	20	2 ,,	15	—	19*e*	—	30*a*	30 {20 major, 10 minor *a*	C
18	23	9 mos	7	—	8*a*	4*a*	—	3*a*	B
19	24	9 ,,	4	—	—	—	—	2*a*	—
20	16	9 ,,	10	—	—	13*a*	—	8 {4 major, 4 minor *b*	D

Notes—Treatment *a*, 3 months, *b*, 6 months, *c*, 9 months, *d*, 12 months, *e*, over a year
A, tremor of legs, which disappeared after "rest" and *did not* recur when epanutin was given again AA, ditto, but *did* recur. F, tremor of legs, which was intermittent FF, long-continued generalised muscular irritability B, dizziness C, transient nausea D, rash without fever DD, recurred rash E, painful and tender gums EE, ditto, which disappeared after "rest" but recurred when epanutin was given again

obtained *complete* relief and 27 per cent. showed a considerable remission. These workers were apparently dealing with the younger and more recent cases of epilepsy, whereas we are considering the very long-established epileptic with definite mental defect, and over the small number cited here the results seem to be less successful

Considerable diminution in number of seizures ..	6
Slight ,, ,, ..	6
No change in number of seizures ..	5
Increase ,, ,, ..	3

Although the foregoing figures appear to show that in 12 of the cases epanutin has been more successful than other drugs, the same proportion (60 per cent.) of successful results cannot be expected over a large series of cases or over a long period of time, for disappointing relapses are by no means uncommon and epanutin has had to be discontinued for this reason. Two of the patients cited as showing considerable diminution have deteriorated mentally, and two others showed repeated temporary confusion and excitement.

Blood-counts have been taken for the purpose of comparison but hardly give any definite information, except that there is a tendency to an increase in the hæmoglobin percentage in 10 cases, leucopenia in 6, and leucocytosis in 7. The small leucocytes are increased in 6 cases and the eosinophils in 4, case 6 showing an increase of both

COMPLICATIONS

In 13 of the cases some complication followed the administration of epanutin—chiefly dizziness, transient nausea, painful and tender gums, and a rash generalised over the body. All of these readily responded to treatment when the drug was stopped, and they gave no cause for alarm In this connexion it is perhaps advisable to point out that, when epanutin is given before food, there is a greater liability to a feeling of nausea, and it is our practice now to give it with a drink of water at the end of a meal. One or two cases have shown long-continued generalised muscular irritability, and it is of interest to note that in these cases the tendency to the replacement of the major by the minor epileptic fit has been particularly noticed Our experience is that, where intolerance of the drug is found, it is well worth while to discontinue it for two to four days and not to give any of the barbiturate group of sedatives in the meanwhile At the end of that time it is usual to find that the toxic symptoms are receding, and the drug can be administered again in the same or in a reduced dose; in several of our cases the complications returned in a mild form until the minimal tolerated dose was found No urinary complications have arisen

CONCLUSIONS

Admittedly the cases cited, though few, are a severe test for any drug; they were selected for that reason. We wish to emphasise that our experience is that epileptic attacks respond in a strange manner to drugs in different patients We do not know of anything which will, in therapeutic doses, react in a similar fashion on every patient, and we know of no specific; so far our experience of epanutin in the chronic case is that some patients respond thereto who responded less or not at all to the other sedatives. Again, some patients do not immediately tolerate the drug well, toxic manifestations, such as dizziness, gingivitis, tremor of the hands, and altered gait, are not uncommon; but they are not severe if the dose is carefully graded, or if the drug is withdrawn altogether for three or four days None of our cases showed a temperature with the rash

It has been noticed that cyanosis is greater in seizures under epanutin than under the ordinary drugs, and the seizures tend to be more severe

It is, we think, fair to say that epanutin has in some cases diminished the frequency of the seizures At the same time, the total number of fits has been but little affected The drug seems to have a sedative action on the incidence; in other words, it is common to find that the patient, instead of having fits every day, goes eight to ten days without any attack and then has several in close succession

We have given 0·1 g in a capsule twice or thrice a day, and in no case has the latter dose been exceeded The results have been sufficiently favourable to warrant an extended trial, and in the younger and less deteriorated epileptics it seems that tolerance to epanutin and the benefits therefrom are at least as good as with the other barbiturates. It is too early to discuss cases which have not been under long continuous observation, because too much reliance has to be placed on the history supplied; but we think that at present the drug provides in some cases

a means of reducing for a time the total of seizures, and, given in non toxic doses, it leads to amelioration in some cases where other drugs have not, two at least of the patients have shown definite mental deterioration, and others show increased confusion after the fit

IDIOSYNCRASY TO ACRIFLAVINE

FAILURE TO TRANSMIT BY BLOOD TRANSFUSION, AND REACTIONS TO ALLIED DRUGS

BY W A YOUNG, B M Oxfd, B Sc Lond, D T M & H

SENIOR MEDICAL OFFICER, SEWA HADJI HOSPITAL DAR ES-SALAAM TANGANYIKA TERRITORY

IT has now been possible to conduct further investigations into the case of idiosyncrasy to acriflavine previously recorded [1]

The Indian was readmitted into the Sewa Hadji Hospital on Oct 25, 1938 The persistence of his idiosyncrasy was proved by the application to his forearm for forty eight hours of a small pad of gauze soaked in a 1 in 2000 solution of acriflavine On the day after the removal of the pad local itching was experienced and slight redness developed at the site of the dressing Next day the area presented a surface of small papules, reminiscent of a nutmeg grater, which persisted to Nov 18 On Oct 28 14 oz of the patient's blood was transfused into an anæmic African patient who had been proved not to have an idiosyncrasy to acriflavine Thereafter the recipient of the blood was tested for his local skin reaction to acriflavine with pads strapped on various parts of the body for forty eight hours at a time, the first pad being applied on the day of the transfusion and the others at two day intervals for a fortnight after the transfusion and again one month after the transfusion At no time during this period did the recipient show any local skin reaction to acriflavine

REACTIONS TO ALLIED DRUGS

To investigate the extent of the idiosyncrasy of the Indian towards drugs of chemical constitution allied to that of acriflavine, various patch tests were carried out with small dressings strapped to the skin for twenty four hours and soaked in 0 05 per cent watery solutions of Atebrin pro injectione, eosin, fluorescein, safranin, acridine hydrochloride, Gonacrine, and Rivanol

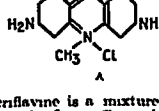
Atebrin and *eosin* were tested simultaneously on different areas of the body On the fourth day the area that had been under atebrin showed a roughened surface similar to that produced by acriflavine but less pronounced, the papules being rather less prominent Itching was experienced as after the acriflavine The area that had been under eosin became very slightly roughened on the fourth day but was normal again by the sixth day There were no reactions with similar tests in controls *Fluorescein* caused a local reaction of intensity greater than that after eosin but less than that after acriflavine When *acridine hydrochloride* was applied, the patient immediately complained that it was stinging him, though no unpleasant sensation was experienced by the dresser, who applied some to his own skin Not even erythema, however, was noticed at any time after removal of the acridine patch test *Safranin* caused merely a slight local erythema on the fourth day *Gonacrine* produced a roughened surface similar to that given by atebrin but as early as the second day—i e, the "nutmeg grater" surface was already developed when the dressing was removed after forty eight hours *Rivanol* gave no reaction

The intensity of reaction for the drugs may be placed in the following order acriflavine, atebrin, gonacrine, fluorescein, eosin, safranin, acridine hydrochloride, and rivanol Their chemical relationship is shown by the accompanying formulæ, kindly supplied by *Mr W D Raymond, the Government analyst*

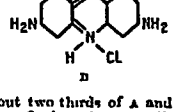
REDUCTION OF REACTION TIME

In view of the early reaction to gonacrine, it was decided to apply a final patch test of acriflavine to see whether a general hastening of the reaction time to the group of drugs had developed A dressing was applied on Nov 16 When it was removed after forty eight hours, the usual rough surface had already been produced The lag of forty eight hours in the reaction to this drug had therefore disappeared The reaction also proved eventually to be of much greater intensity on this occasion, severe confluent pustulation developing after a few days and necessi

Acridine

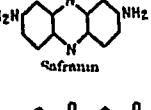


A

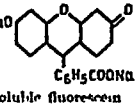


B

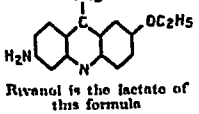
Acriflavine is a mixture of about two thirds of A and a third of B Gonacrine, or euflavine, is neutralised acriflavine



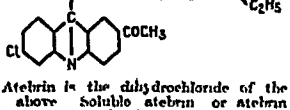
Safranin



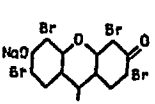
Soluble fluorescein



Rivanol is the lactate of this formula



Atebrin is the dihydrochloride of the above Soluble atebrin or atebrin musonat is the dimethane sulphonate of atebrin.



Eosin

tating the patient's readmission to hospital on the 24th On Nov. 18 a "nutmeg-grater" surface still persisted at the site of the acriflavine test of Oct. 25, and a faint stain could be detected at the site of the earlier test in June

I am indebted to the director of medical services, Tanganyika Territory, for permission to publish this paper.

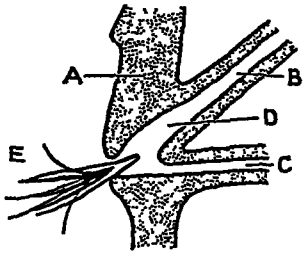
ACUTE PANCREATITIS CAUSED BY A BARLEYCORN

BY FRANK FORTY, M.B Lond., F.R.C.S.
SURGEON TO REDHILL COUNTY HOSPITAL, EDGWARE

ACUTE hæmorrhagic pancreatitis is in many instances associated with gall-stones In consequence, biliary obstruction or infection of the biliary system is generally held to cause the pancreatitis. Special interest therefore attaches to those exceptional cases of acute pancreatitis which are not associated with gall-stones or any demonstrable pre-existing lesion in the biliary tract. Only occasionally in such circumstances is some definite mechanical cause discovered, as in the cases published by Rigby (1922–23) and Novis (1922–23), in which a roundworm was found in the pancreatic duct, and in the case reported here, in which the outlet of the ampulla of Vater was obstructed by an impacted barleycorn

CASE-RECORD

A housewife, aged 68, was admitted to Redhill County Hospital on Dec. 2, 1938. She had vomited at 3 P.M. on the previous day, and soon afterwards severe pain started in the upper abdomen and persisted throughout the night, becoming localised somewhat in the right side of the abdomen and radiating to the right shoulder. There was no further vomiting, but there were periodical eructations of bitter fluid. In the past she had had occasional attacks of pain in the right iliac fossa, and she had also been troubled by some indigestion



Barleycorn impacted in ampulla of Vater. A, duodenal wall; B, common bile-duct; C, pancreatic duct; D ampulla of Vater; E, impacted barleycorn.

On examination she was a fat woman, obviously in severe pain and perspiring freely. Her temperature was 97° F. and her pulse-rate 96 Her tongue was clean The abdomen was distended and tense, and it was very tender in the right hypochondrium and in the right iliac fossa.

Operation.—On the day of admission I performed a laparotomy under general anæsthesia, opening the abdomen by a supra-umbilical right paramedian incision The peritoneal cavity contained much dark-brown bloodstained fluid, and there was obvious fat-necrosis of the omentum. The pancreas was enlarged and felt abnormally hard. The gall-bladder appeared perfectly normal; its wall was thin and its peritoneal coat healthy and free from adhesions. No gall-stones could be felt in the gall-bladder or in the common duct. Acute hæmorrhagic pancreatitis was diagnosed, and the abdomen was closed with drainage. The patient died a few hours after the operation.

Post-mortem examination.—The following is an extract from Dr. Hamilton Patterson's notes on his post-mortem examination. The gall-bladder was normal. The common bile-duct was not dilated. No gall-stones were present. The opening of the ampulla of Vater into the duodenum was obstructed by a barleycorn, the pointed end being embedded in the ampulla and the whiskers sticking out into the duodenum (see figure). Bile could be squeezed from the gall-bladder into the duodenum with some difficulty. The head of the pancreas was hæmorrhagic and was hard and rubbery to the touch. Extraperitoneal fat round the pancreas and in the great omentum showed many spots of fat-necrosis There was some blood in the peritoneal cavity, and the coils of small intestine were stuck together. Microscopical sections showed acute necrosis of the pancreas and advanced fatty change in the liver.

DISCUSSION

The case reported here has, I believe, a considerable interest as a surgical curiosity I am not aware of any previous record of a foreign body impacted in the ampulla of Vater associated with and evidently causing acute pancreatitis Of more significance, however, are such inferences as may be drawn from this case bearing on the ætiology of acute pancreatitis in general.

Our knowledge of this subject is still inconclusive. Chemical or enzyme action on the pancreatic tissues, due to the interaction of bile and pancreatic juice in the pancreatic ducts, and bacterial infection of the pancreas by one route or another are regarded as the usual causes of the characteristic lesions. The task of allocating the principal rôle to one or other of these factors is complicated by the fact that both of them together destroy pancreatic tissue in those advanced stages of the disease which are alone available for investigation.

Opie (1901) is credited with the first description of acute pancreatitis associated with the impaction of a gall-stone in the ampulla of Vater. He emphasised that the calculus was small, 3 mm in diameter, and said that the pancreatic duct was slightly dilated and stained with bile. He pointed out that a large stone impacted in the same situation would have obstructed the outflow of both pancreatic and common bile-ducts and so would not have caused the mingling of bile and pancreatic juice in the pancreas The mechanical conditions in the ducts in this case could be regarded as being equally favourable to the destruction of the pancreas either by activated pancreatic juice or by organisms derived from an infective cholecystitis In the same paper, however, Opie described experiments which demonstrated that injection of bile into the pancreatic duct of an animal caused necrosis of the organ.

The impaction of a suitably sized gall-stone in the ampulla of Vater is a rare finding in acute pancreatitis Thus, Waring and Griffiths (1923–24), reviewing a series of 39 cases, say that "only in one case, however, have we found definite evidence of obstruction in the ampulla of Vater, or of regurgitation of bile although jaundice has been present in seven cases"

Since, therefore, effective obstruction of the ampulla can be assumed only in a small minority of cases of acute pancreatitis, either an alternative cause of the diversion of the bile into the pancreatic duct must exist, or the view cannot be maintained that bile is an essential cause of the lesion. Such an alternative did in fact suggest itself as a consequence of the description by Oddi (1888) of the sphincter, which now bears his name, controlling the outflow from the ampulla of Vater into the duodenum His experiments were independently confirmed by Archibald and Brow (1919), who concluded that a spasm of this

muscle, which they found capable of withstanding a considerable hydrostatic pressure, would be effective in diverting the flow of bile into the pancreatic ducts and so causing acute necrosis of the pancreatic tissue This theory has not, however, met with general acceptance, and Waring and Griffiths (1923–24) express the more generally held view that the cause of acute pancreatitis is a bacterial infection, probably streptococcal, and that "retrograde infection along the pancreatic ducts by bile is probably a less common cause than lymphatic infection, although its occurrence has been definitely proved"

The chief significance of the case reported here is that the only definite abnormality was obstruction to the outlet of the ampulla of Vater (by an impacted barleycorn), and that in the absence of gall stones and of any signs of inflammation in the gall bladder and bile-ducts it can be reasonably assumed that the presence of bile in the pancreatic ducts was alone the cause of the acute pancreatitis We are therefore provided clinically with a set of circumstances which can usually only be observed by experiments on animals Evidence is thus furnished in support of the view that, when acute pancreatitis develops in the absence of gall stones or of any pre existing disease of the biliary system, bacterial infection from the duodenum or other source need not necessarily be assumed as the causal agent Spasm of the sphincter of Oddi, by inducing a flow of bile into the pancreatic ducts, could of itself create the conditions essential for the onset of acute pancreatitis

The evidence of this case also supports the opinion of Archibald and Brow (1919) that when possible, the surgical treatment of acute pancreatitis should include opening and drainage of the common bile-duct rather than simple drainage of the gall bladder, for this permits of the passage of a probe through the ampulla into the duodenum Their further recommendation that the duodenum should be opened and the sphincter divided is scarcely applicable to most cases, and most surgeons will readily agree with their observation that "in the acute cases, with the patient in a precarious condition, the least degree of interference is probably the best, and that would obviously consist in a cholecystostomy"

I am indebted to Mr J N Deacon, medical superintendent of Rodhull County Hospital, for permission to submit this case for publication.

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MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SCIENTIFIC MEETINGS, JULY 26–28

SECTIONS OF MEDICINE, SURGERY, OBSTETRICS, PHARMACOLOGY AND PATHOLOGY

At a meeting of these sections under the presidency of Prof DAVID CAMPBELL (Aberdeen) a discussion was held on

Sulphanilamide Chemotherapy

Prof C H BROWNING (Glasgow) said that the place of the sulphanilamide drugs in therapeutics was almost entirely the fruit of laboratory study In experimentally produced streptococcal infections in mice individuality appeared to be a prominent feature of responses to treatment with the sulphanilamide drugs, a relatively small dose might cure one mouse whereas much larger doses might fail in others There was no clear evidence that different members of the sulphanilamide group were more effective for one type of bacterial infection than for another, and the development of drug resistance in a virulent strain of organisms after unsuccessful treatment had not been generally established The drugs were relatively inefficient in the treatment of localised infections of some duration and diseases due to exotoxins, such as diphtheria The properties of these drugs demonstrable in vitro did not explain their therapeutic effect and did not supply data for assessing their curative action A gradual direct action of the drug on the metabolism of the organism in the infected animal, according to the hypothesis of McIntosh and Whitby, could not be excluded but it was more likely that the body, while under the influence of the drug, behaved towards highly virulent organisms much as the normal animal did to non pathogenic types, which were slowly destroyed

Dr G A H BUTTLE (Beckenham) divided the derivatives of sulphanilamide into two groups those with substituents in the amino group, and those with them in the amide group In the first group were Prontosil rubrum, Prontosil soluble, Rubiazol, Proseptasine and Soluseptasine The activity of this group was probably due to their breakdown within the body to sulphanilamide Drugs of this group had no advantage over sulphanilamide in the range of infections which could be dealt with and although some were less toxic they were also less active than sulphanilamide In the second group were Uleron, Albucid and M & B 693 These drugs probably did not break down into sulphanilamide within the body, but were themselves the active agents against the bacteria M & B 693 was effective in infections with pneumococci of all types, whereas sulphanilamide acted only against type III; it was more effective than sulphanilamide in staphylococcal and gonococcal infections and equally effective in streptococcal and meningococcal diseases The superiority of uleron in staphylococcal and gonococcal infections had not been established, this drug tended to produce peripheral neuritis Albucid, which appeared to be completely non toxic, was effective in gonorrhœa especially in females Sulphanilamide was rapidly absorbed and was readily diffusible throughout the body, a part of the drug in the blood and urine was converted into the inactive acetyl derivative A concentration of sulphanilamide in the blood of 10 mg per 100 c cm was required for the treatment of severe infections This could be obtained by a dosage of 1 gramme per day for every 20 lb of body weight Children however, needed 50 per cent more and infants about three times as much per unit body weight Among the toxic symptoms produced by these drugs, agranulocytosis was the only fatal complication, and it occurred usually late in treatment It was very important to do white-cell counts after treatment had been continued for ten days and every third to fourth day thereafter, The most common symptom was cyanosis, but this

should not be regarded as a sign of overdosage. Occasional hæmaturia was due to the deposition of the acetyl derivative in the renal tract. Vomiting and mental depression were more common with M. & B. 693 than with sulphanilamide.

Dr. H. S BANKS (London) said that in a series of 28 cases of meningococcal meningitis given sulphanilamide alone no deaths had occurred, and of 34 cases given M. & B. 693 only one had died Relatively high mortality-rates occurred when serum alone was used, and when serum was administered in conjunction with insufficient doses of sulphanilamide. It was a good plan to change the drug used from M. & B. 693 to sulphanilamide when mental depression became marked, usually after thirty-six hours Four cases had been treated in this way with good results. The concentration of the drug in the cerebrospinal fluid had been found to follow closely the blood level and was approximately half as high.

Dr. F J. T. BOWIE (Aberdeen) described the results of using sulphanilamide drugs in the treatment of gonorrhœa Sulphanilamide gave cures in 70–80 per cent of cases, uleron in 70–90 per cent. and M. & B. 693 in 85–95 per cent. M. & B. 693 appeared to be the drug of choice since it could be given at once, whereas optimal results with sulphanilamide and uleron were obtained only if treatment were postponed for about ten days from the onset of the disease. After treatment with M & B 693 there was a very low incidence of complications (1·5 per cent.) as compared with the high figure (25–30 per cent.) which was the rule before chemotherapy. A total of 20 grammes of M. & B. 693 was sufficient. This could be given in daily 3-gramme doses for six or seven days, or 4 grammes could be given at once, then 2 grammes four hours later, followed by 1 gramme four times a day until the total amount reached 20 grammes. When the latter method was used, nausea lasting from twelve to twenty-four hours was common, but otherwise there appeared to be no danger and the results were better. In a series of seven cases of gonococcal ophthalmia neonatorum treated with M & B 693 all became bacteriologically negative within thirty-six hours; the confinement to hospital was reduced to about seven days as compared with the much longer periods needed for the older methods of treatment.

Dr. W. F. GAISFORD (Birmingham) said that in 627 cases of lobar pneumonia occurring between March, 1938, and June, 1939, a mortality-rate of only 5 4 per cent had been achieved as a result of treatment with sulphanilamides A striking decrease in mortality had occurred in elderly patients. The results in bronchopneumonia were not so good and this was probably due to the mixed type of infection. In the 627 cases of lobar pneumonia, a clear pleural effusion which did not proceed to pus formation was found in 10. The incidence of empyema was 4·5 per cent and the combined figures for clear effusion and empyemata were approximately the same as the incidence of empyema in 1937, before chemotherapy. This suggested that the clear effusions represented empyemata aborted as a result of chemotherapy.

Dr MEAVE KENNY (London) said that the death-rate from streptococcal puerperal infections had been reduced from about 28 per cent. to about 5 per cent. by sulphanilamides. An early series of cases had received an average of 18 grammes of prontosil rubrum and the mortality-rate in this series (5·3 per cent.) had not been improved upon by much larger doses of sulphanilamide in subsequent series. There was now a tendency to give too large doses and a return to moderate doses of prontosil rubrum would produce less toxic effects. In the sulphanilamide treatment of *B. coli* pyelitis of pregnancy the smallest possible dose should be used, in view of the labile character of the hæmopoietic system at this time Usually 1·5 to 2 grammes in twenty-four hours was sufficient and more than 3 grammes had never been necessary. The proper prophylaxis of puerperal infections by strict attention to asepsis should not be relaxed. The sulphanilamide drugs should be used as a prophylactic measure only when there was reason to suspect the presence of pathogenic streptococci in the atmosphere, and in such cases the drug should be given in full curative doses

Dr. W. R. SNODGRASS (Glasgow) said that although there was general agreement regarding the efficacy of sulphanilamide therapy in tonsillitis there was actually a scarcity of properly controlled studies In his experience acute widespread and invasive infections responded best, and the poorest results were found in single walled-off lesions such as quinsy In scarlet fever sulphanilamide therapy had no significant effect on the initial symptoms or signs, or on the incidence or duration of complications. In a carefully controlled study of the treatment of erysipelas by sulphanilamide he had found that the drug was of great value and suggested that a suitable dosage in adults was 1½ grammes of prontosil rubrum or 1 gramme of sulphanilamide every four hours until the lesion had ceased to spread and the primary pyrexia and toxæmia had ceased; thereafter 1 gramme thrice daily should be given for fourteen days to prevent relapse.

Dr. P. H. MANSON-BAHR (London) pointed out the striking fact that sulphanilamide had no effect on malaria in man although it acted like a charm in *Plasmodium knowlesi* malaria in monkeys The results in undulant fever in man had been on the whole favourable, but not dramatic, and good results had also been obtained in the treatment of actinomycosis

Dr. THOMAS ANDERSON (Glasgow) considered that before the results of treatment of different series of cases of lobar pneumonia could be fairly compared it was essential to know the types of pneumococcus producing the lesion. In Glasgow the incidence of type II pneumonia was very high and therefore the mortality-rate would not be so low as in districts where type I infections predominated. He stated that 0 4 gramme of rubiazol was equivalent to 1 gramme of sulphanilamide in the treatment of erysipelas and accordingly the action of rubiazol could not be entirely due to its breakdown into sulphanilamide within the body.

Dr. E N. MACDERMOTT (Galway) said that he had gained the impression that in lobar pneumonia treated with sulphanilamide resolution of the consolidated area was slower, and in empyema the pus was thin in consistence. These changes might be due to the leucopenia which so often accompanied administration of the sulphanilamides.

Professor CAMPBELL considered that a concentration of sulphanilamide in the blood of 4 mg. per 100 c cm was probably as effective as a concentration of 10 mg Rectal administration of the drug suspended in saline and alkalinised to bring it into solution should be used as an alternative to parenteral injection where severe vomiting rendered oral administration impossible. Because of the immense amount of human suffering which had already been prevented by the use of the sulphanilamide drugs the sanity of any individual who still wanted a justification for experimental work in animals must be questioned

SECTION OF MEDICAL SOCIOLOGY

At a meeting of this section with SIR JOHN ORR, F R S, the president, in the chair, a discussion on

Food Conservation in Relation to the National Food-supply

was opened by SIR JOSEPH BARCROFT, F R S (Cambridge) He began by disclaiming any intention to deal with Government policy, how much the Government saw fit to store of this and that was not his affair All he proposed to do was to say something about what science has done to increase the selection of food at their disposal From this standpoint foodstuffs fall into three classes —

(1) Those that can be kept indefinitely—in practice, say ten years

(2) Those that can be kept for a season—say ten months

(3) Those that can be kept on any ordinary voyage —say two months or less

In the first group is wheat, its storage against emergencies is as old as the book of Genesis, where it is seen that Joseph had his seven year plan Not all wheat keeps indefinitely, and the critical characteristic appears to be the water content In the best wheats the water content is low and the wheat will keep Home grown wheat has not a high keeping property, but at the moment this does not matter much because the demand for grain so far outruns the home supply that home wheat can be eaten at once Weevils also constitute a major problem in wheat storage over long periods, but not perhaps an insoluble one While wheat is very bulky, flour can be stored in a smaller space, its water content can be reduced to about 11 per cent, and it will then keep a very long time in tins, where it is inaccessible to both water and weevils Whale oil and vegetable oils can be kept for three or four years if air is excluded Canned meat of various sorts, if properly packed is entirely suitable for food for a very long time When discussing any possible loss of vitamin value, comparison should always be made with cooked fresh meat, not raw meat

Of foods that can be stored over a season milk is the most important, said Sir Joseph, for it contains all essential nutritive elements and food factors in an easily digestible form It is possible that the best dried milk may even be held at refrigeration temperature for ten years, with some alteration of flavour but not of nutritive value Next in importance to milk are potatoes These are ordinarily kept only for a season, but they will last much longer if dried until the water content is only about 8 per cent There are on the market preparations—notably in the form of powder—which are quite satisfactory as regards keeping quality and palatability Eggs are preserved best over a season in cold storage in an atmosphere containing 2–2½ per cent CO_2 and with the air highly but not completely saturated with aqueous vapour In conclusion the speaker said he thought that much work could be saved, prices stabilised and speculation discouraged by a policy of storage of foodstuffs which could be released in the correct quantities at the appropriate moments

MR G A REAY, D Sc (Aberdeen) speaking on the preservation of fish, pointed out that, unlike meat or game it does not improve on hanging Marine bacteria are main agents of spoilage Even under the best conditions of handling and stowage, gutted white fish will not keep fresh in crushed ice for more than 10–12 days and for herring stowed without gutting, according to custom the limit is 4–6 days Smoked fish, such as "finnans" and kippers, keep satisfactorily no longer than a week at ordinary temperatures, and no longer than a fortnight at 0° C (32° F) The bulk of our national supply of fish is normally stored only for such short periods Both white and fatty fish can be held, however, in excellent condition for a season—i e, for anything from two months to a year—by proper freezing and cold storage Thus herrings, if rapidly frozen, well glazed, and stored at −30° C (−22° F) remain in first-class condition for six months, after which the fat gradually becomes rancid White fish similarly treated remain in excellent condition for a year or more, and certain species, such as lemon sole, have been found highly palatable after four years Kippers have been successfully stored at −30° C (−22° F) for four months and smoked white fish for six Fish can also be successfully preserved for a season by canning Both wet and dry salted fish keep in good condition with certainty for a season if a chill temperature is used, say, 0° C (32° F) to −3° C (26 6° F) On the question whether fish can be kept in any way for long periods, such as ten years, Dr Reay said that few reliable data are available It is possible that white fish, though not fatty fish, would store well for a good part of this time at −30° C (−22° F) Certain oily packs of canned fish are said to have been successfully preserved for ten years Hard dried salted fish would probably keep at 0° C (32° F) in good condition, for several years if suitably packed in airtight containers Freezing and cold storage, properly applied, is preferable to all other methods of preserving fish, since it has least effect on the flesh

MR FRANKLIN KIDD, D Sc (Cambridge) discussed fruit and vegetables For long distance transport and for season-to-season storage refrigeration is used, together with control of the oxygen and carbon-dioxide composition of the atmosphere of the store For longer storage three methods are available—freezing, drying and canning It is known on what principles long period storage should be based, but there has been little practical experience over this period It is rather the deterioration of the can than of the contents that sets a limit to the storage possible, for the metal is corroded by the contents By the application of lacquer, tin and iron can be very thoroughly, but not yet completely, protected against the contents of the can By this means blackcurrants, cherries and damsons have been kept for six years, raspberries, loganberries, blackberries and strawberries for four years, beetroot and carrots seven years and peas ten years If canned goods are held at a low temperature their storage life increases considerably Freezing and holding at a very low temperature is an obvious method for preserving fruit and vegetables The freezing should be carried out very sharply so that more of the juice is retained on thawing The products are superior as regards palatability and appearance to those preserved by canning A pre-freezing heat treatment of short duration prevents disagreeable flavours and discoloration in certain vegetables and fruits where these tend to occur with freezing Freezing requires expensive machinery and constant attention where is the storage of canned products needs no special equipment

Dried products are in three categories seeds and seed products, products like raisins which bear little resemblance to the fresh fruit, and apples, pears and vegetables which simulate the fresh article when reconstituted with water It is important to reduce the water content to a low level and exclude oxygen A new method of low temperature drying produces dried products which retain their natural shape and colour and also completely the natural flavour

Summing up, Mr. KIDD said that only certain fruits and root crops, but no green vegetables, can be stored for twelve months in a fresh condition By canning, freezing or drying all kinds of fruits and vegetables can by present procedure be stored easily up to two years with complete retention of their nutritive value and by taking the necessary precautions they could certainly be stored for much longer

Mr. W. GODDEN (Aberdeen) remarked that almost every type of perishable food is canned in Great Britain, and it is therefore important to have reliable information on the nutritive value of canned foods. Work on these lines has been done in America and France but little with reference to foods canned in this country. At the Rowett Research Institute, Aberdeen, a long-period feeding trial with rats was undertaken.

One group of rats was fed entirely on canned foods such as beef brisket, tongue, herrings, Brussels sprouts, cabbage, spinach, beetroot, carrots, turnips, potatoes, dwarf beans, green peas, haricot beans, apples, cherries, plums, tomatoes, dried milk and syrup. Similar foods when in season were purchased or grown locally and used for the second group; at other times vegetables of a like nature were substituted for those not in season, and the same applied to fruit and fish. If anything the experiment was unduly weighted against the canned food in that most of the vegetables were grown at the institute and gathered on the day they were required for feeding Each group originally consisted of 10 does and 5 males. When they reached maturity they were allowed to breed.

The experiment lasted eighteen months, during which time 1700 rats were used in four successive generations, approximately half of which received nothing but canned foods from weaning onwards No significant difference was found in the size of the litters, average weight at birth and at weaning, mortality at birth or from birth to weaning, or in growth-rate of each successive generation from weaning to 119 days The rat is not susceptible to a deficiency in vitamin C, so it could not be shown whether any destruction of this factor had occurred in canning and storage. Experiments by Miss Olliver at Cambridge, however, have shown that the destruction of vitamin C when fruit and vegetables are canned is small and likely to be much less than that caused by shop storage of fresh foods and their subsequent household cooking Canned foods, in Mr. Godden's opinion, may be used with perfect confidence from the nutritional point of view.

Prof H D KAY (Reading) said that given enough calories, roughage, and iron (and perhaps copper) in the diet, a pint of milk per day in addition will ensure effective nutrition in almost any human being. Therefore the conservation and storage of milk with a minimum of damage is one of the most serious items of food-defence policy The storage of a food material containing over 87 per cent. of water is not economically sound One of the desiderata of milk conservation is to obtain a product which is readily convertible into a liquid milk resembling the original liquid milk. There are at present two main methods of conservation of whole milk: (1) condensing it by evaporation to about a third of its volume, with or without the addition of cane-sugar, followed by sterilising in sealed tins; and (2) drying completely, or almost completely, and storing in suitable containers. Unsweetened evaporated milk and condensed full-cream sweetened milk, when properly prepared and and kept cool, will remain almost unchanged for years.

Dried milk in some respects—e g, its relatively greater food value per unit of storage space—is a preferable article as regards conservation, but until very recently its keeping powers were inferior. The development of a tallowy flavour in dried milk may be considerably delayed by storing it in air-proof tins and evacuating the tins and filling with nitrogen or other inert gas Such dried milks will keep for eighteen months at least at ordinary temperatures and probably much longer at 0° C. Dried milk manufactured in this country is usually made from spring and summer milk, at its most nutritious stage, and when made up with water to the original volume may actually be more nutritious than some fresh winter milks In war-time the compulsory addition of fairly large quantities (say up to 10 per cent) of dried milk to the flour mixture used in bread-making might prevent serious nutritional deficiencies

SECTION OF PHYSIOLOGY

AT the meeting of this section on July 27, with Prof E. D ADRIAN (Cambridge) in the chair, a discussion on the

Pathology of Chloride Metabolism

in man was opened by Dr. ALEXANDER LYALL (Aberdeen). He said that during the preceding decade much importance had been attached to the disturbances of chloride metabolism in man with reference to a group of diseases, including intestinal obstruction, pyloric stenosis, chronic nephritis, œdema, obesity, hypertension and Addison's disease The principles which controlled the chloride balance of the body and determined the absorption, secretion, reabsorption and excretion of chloride were of significance in these diseases He outlined the normal cycle of chloride metabolism in the healthy adult and showed from experimental data that the average daily intake of chloride was about 12 grammes, that the basal requirement was about 2 g in the absence of abnormal perspiration, and that there was a continuous process of secretion and reabsorption to and from the intestinal lumen The daily tidal exchange of chloride in this way amounted to about 50–60 g, equal to half the total available chloride in the blood-plasma and tissue fluids The gastric secretion of chloride could amount to 30 g. in 24 hours, as shown by continuous gastric aspiration, and the biliary secretion contained up to 9 3 g of chloride daily in a patient with a biliary fistula. In intense sweating the skin loss in chloride could reach 12 g. daily and such losses were met with in acute febrile disturbances, in the sweats of tuberculosis and acute rheumatism, in pneumonia and thyrotoxic crises, and during heavy muscular exertion in hot surroundings. The main controlling influences concerned in the maintenance of the chloride-content of the blood-plasma and body fluids were the kidney itself and an adequate intake of chloride The former played the major part since excretion of chloride in the urine ceased as soon as the plasma-chloride showed any tendency to diminish Comparison of the chloride-content of the blood and urine in patients with hypochlorræmia following intestinal obstruction and in patients with experimental hypochlorræmia made it clear that renal secretion of chloride ceased when the plasma-chloride level fell to 520 mg. per 100 c cm. This figure was almost constant in health, but might be raised in certain types of renal disease with œdema, or lowered in some cases of intestinal obstruction with secondary toxic nephritis

Dr. Lyall then described the clinical manifestations of hypochlorræmia, which included anorexia and nausea, mental apathy, muscular cramp, and even

disorientation and convulsions The condition was complicated by dehydration and alkalosis in higher types of intestinal obstruction and often by acidosis in lower intestinal obstruction In treatment the administration of adequate amounts of fluids and salt was necessary and if this could not be efficiently attained by the intravenous route recourse might be had to jejunostomy with success Dr. Lyall pointed out the importance of the continuous secretion of chloride by the stomach in pyloric stenosis It was shown from experiments on patients with pathological hypochloræmia that the gastric mucosa was still able to elaborate a secretion containing normal amounts of sodium chloride In experimental hypochloræmia in man the gastric content was found still to contain 640 mg per 100 c cm of sodium chloride when the plasma chloride value had fallen to 365 mg per 100 c cm The total volume of gastric juice was reduced by 50 per cent It was clear that the secretion of free HCl and chloride by the gastric mucosa was, to a large extent, independent of gross changes in the chloride content and alkaline reserve of the blood plasma

In Addison's disease Dr Lyall had noted in 1937 that the chloride excretion in the urine was high in relation to the chloride level of the blood-plasma He and I A Anderson had then stated from observations on two patients with Addison's disease that where the urine contained over 200 mg chloride per 100 c cm, while the plasma chloride level was below the minimum normal level of about 530 mg per 100 c cm, the diagnosis of Addison's disease was strongly suggested Cutler, Power and Wilder had tested the validity of this suggestion by preliminary observations on nine subjects with adrenal insufficiency and on eight subjects without evidence of disease of the adrenal glands In recent investigations on patients presenting clinical features suggestive of Addison's disease, he and Anderson had established that a ratio of less than 2 to 1 between the plasma and urine chloride after a test period of chloride free diet was diagnostic of Addison's disease

PREVENTION AND TREATMENT

Mr D L C Bingham (Edinburgh) was unfortunately unable to read his paper on hypochloræmia In his résumé he referred to the work of Dick, Maddock and Coller, who suggested that salt deficiency should not develop if losses from the gastro intestinal tract were replaced with equal volumes of physiological saline With Bartlett and Pedersen, Mr Bingham had found this replacement method effective in prevention Many patients however came under observation when a substantial but unknown loss of sodium chloride had already occurred Various workers, including Haden and Orr, and Falconer and Lyall, had attempted to make a basis for quantitative administration of chlorides The latter had found that it required approximately 15–30 g of salt to raise the plasma chloride by 100 mg per 100 c cm

Mr Bingham had based the rationale for chloride replacement on the assumption that the percentage reduction in the chloride concentration of extracellular fluids was equal to the percentage decrease in the total chloride-content of the fluid and that the plasma chloride concentration was a satisfactory index of the chloride-content of extracellular fluids Assuming the normal chloride content of the body to be 0·248 per cent of the body weight, the formula could be reached that chloride lost was equal to

$$\frac{560 - X}{560} \times 0{\cdot}248 \times \text{weight in kilogrammes},$$

where X was plasma chloride value. Simplification of this formula produced the finding that 0·2 g sodium chloride per pound of body-weight was required for each reduction of 100 mg per 100 c cm in the plasma chloride value

Mr Murray A Falconer (Oxford) said that surgeons everywhere were now aware of the necessity for correcting disturbances of chloride metabolism by the administration of infusions of saline in those conditions where hypochloræmia might arise He pointed out that although chloride was the principal ion which was lost in the gastro intestinal secretions, other ions, particularly the bases sodium and potassium, were also lost from the circulating fluids In collaboration with Osterberg and Bargen he had recently investigated the alterations which took place in the concentrations of the individual bases of the blood in patients suffering from intestinal obstruction They did not find that changes in the chemical composition of the blood constantly accompanied intestinal obstruction but that when changes did occur there was a tendency for the concentration of sodium, potassium and calcium to decrease with most marked alteration in the serum potassium These observations on the serum-potassium level in obstruction of the bowel in man were not in accord with the findings of Scudder, Zwemer and Truszkowski, who noted an increased concentration of the blood potassium in cats with experimental obstruction The difference was possibly associated with the higher concentration of intracellular potassium in man

In their clinical investigations Mr Falconer and his co workers noted a general parallelism between the condition of the patient and the degree of disturbance of the chemistry of the blood When the clinical condition of the patient was deteriorating the values of the serum sodium and the serum bases showed a tendency to fall, but when clinical improvement was taking place the blood constituents tended to resume their normal levels They were unable to correlate any definite symptom or symptoms with the low levels of sodium, potassium or calcium in the serum, but they felt that these alterations contributed towards the degree of severity of the intoxication In three patients carefully investigated the addition of potassium and calcium salts to parenteral saline brought about improvement not achieved by saline alone Mr Falconer was of the opinion that solutions, such as Ringer's solution and others containing potassium and calcium in addition to sodium salts, should be used in the treatment of patients showing hypochloræmia

SECTIONS OF DISEASES OF CHILDREN AND MEDICAL SOCIOLOGY

Prof G B Fleming (London) presided at a joint meeting of these sections for a discussion on

Nutrition of the Mother and Child

Sir John Orr (Aberdeen) said that till a few years ago the physiology of nutrition had dealt almost exclusively with caloric and protein needs Stress had been laid on man values which were absolute and little attention had been paid to the quality of food Man-values were useless, however, for the growing child or pregnant mother, they needed everything for the growing man plus material for growth The faster the rate of growth the greater the call for extra food, and in late pregnancy the mothers' needs were greater than in the early months Many mothers of the poorer classes had reached a stage of malnutrition where they had no reserves for their growing children Recent studies had shown that, with a calcium deficient diet, pregnant women

showed a variety of symptoms, and that their children, when not stillborn, were often poorly developed. Another common deficiency in the diet was vitamin A and it might reveal itself by a prolonged gestation period and a high infant-mortality. Knowledge of the nutrition of the mother and child in early years was still grossly inadequate Dietetic deficiencies were almost always multiple. The problem was what are the dietary requirements of the pregnant woman. It had been shown that the pregnant woman required more protein and iron and three times as much calcium as the adult man. An important advance towards better national health had been made by the League of Nations Committee which concentrated its attention on the health of mother and child. It was unfortunate that the kind of diet recommended, which included a litre of milk, an egg and fresh fruit daily, was beyond the purchasing power of many working-class families As the diets got worse there was always a rise in infant-mortality and morbidity-rates. What would happen if they could give an adequate diet such as that recommended by the League committee? An improvement of physique would certainly result Even with old people, they had shown in Aberdeen that great improvement in the calcification of bones could be got by giving a diet adequate in calcium After only six weeks' adequate diet, nearly two-thirds of the weedy army recruits rejected on medical grounds were almost fit for service. The results obtained in school-children in Scotland had been even better. Increased muscular strength and mental ability followed the giving of supplementary diets. The time was ripe for a large-scale test on expectant mothers The result of giving adequate food to two or three thousand women in a district where infant-mortality was high would show how much maternal and infant-mortality rates could be reduced. Diseases of children could, in all probability, be lessened and the physique of the next generation improved by the application of the results of such an investigation.

Prof J C. DRUMMOND (London) said that Sir John Orr's problem might be partly answered by investigations going on in London where 5000 mothers had been given supplementary calcium and iron daily during pregnancy, and controlled observations were being made of mortality and morbidity. Estimates of the amounts of vitamins required for health had been going steadily up, a good natural diet might not contain anything like the estimated optimum of vitamin D, for example. It was possible that if the calcium and phosphorus requirements of the body were fully met, the amount of vitamin D necessary might be minimal There was not much seasonal variation in the vitamin D of human milk; women on poor diets might however yield milk with a poor content Even when getting halibut oil some of his patients had not shown much improvement and the optimum might be 6–7 units per 100 c.cm of milk. Women with a calcium intake of as low as 0 27 g. might still give milk with a normal calcium content. Was the extensive analysis of human milk possibly a reflection on the inferior types of diet common for the last 60 years? There was a tendency to exaggerate the importance of certain vitamins which could be had solely from natural food.

Prof. NOAH MORRIS (Glasgow) stressed the mineral aspect of nutrition Calcium was important in the control of neuromuscular excitability, the acid-base equilibrium and cellular permeability as well as skeletal growth. A good calcium diet for the mother might improve breast milk and recent work in Norway had emphasised this point The total mineral requirement in the last two months of pregnancy was 1 45 g. per day The expectant mother should therefore get a quart of milk a day in addition to the ordinary diet. While growth depended on the calcium intake, the deposition of lime involved other factors. The only condition in which he had found much delay in calcification of the bones was cretinism. In Glasgow, where 489 children had been examined for rickets, only 16 had been diagnosed in the first instance, but with careful examination over 49 per cent. had two or more signs of the disease. He had often seen the disease in the first three months of life and it was important to take antirachitic measures in children from rickety areas. The boiling of milk had no effect on its calcium, phosphorus and nitrogen content. Vitamin D should be given, the convulsions so often seen in children were due to a deficiency of the vitamin and later on to a poor intake of calcium Preventable osteoporosis had, he believed, a much higher incidence than was commonly known

Dr. H. E. MAGEE (London) said that of 100 pregnant women examined in Blackburn 39 had a low serum calcium, but there was no relationship between symptomatology and the mineral deficiency Those women who had symptoms such as headache and vomiting had also high blood-phosphatase values, and these high values were statistically significant. In the West Riding of Yorkshire they had already examined over 200 pregnant women and they hoped to be able to get some interesting information.

Dr. J. C. SPENCE (Newcastle-on-Tyne) said that there had been an obvious improvement in health in the last 20 years Xerophthalmia was common in industrial areas in 1926; he thought it would not be likely to reappear again even under similar unfavourable conditions. But the economic situation still made one pause to think. All cases of rickets should be notified and fully investigated. Unfortunately with an increased income there was often no corresponding increase in the quantity or quality of the diet Ignorance and incompetence were other problems Incompetence was rare and ignorance should be treated by propaganda. There had been he held an unfortunate deterioration in housecraft. He doubted if there was much to be alarmed about in the drain of calcium from the lactating woman Even among the well-to-do exposure to infection was the serious risk

Dr GRACE CUTHBERT (New South Wales) thought that the services in Scotland were too much concentrated on the poor mother who often had not the vitality to follow the advice given. In her own country a school of mothercraft directed by leading pædiatricians had done much good

Professor DRUMMOND mentioned similar schools in London where simple talks on dietetics were given and where simple meals were cooked.

Dr. ELINOR SIMPSON (St Andrews) said that propaganda was needed for breast-feeding. In every system there were indications of better health on breast-feeding

Dr W. G. WICKREMESINGHE (Ceylon) mentioned that calcium deficiency was very common among his people and complementary feeding to breast-feeding was often necessary.

Dr. W. G BOOTH (Boston) stressed the willingness of public-health officers to assist in solving dietetic problems; unless notification of rickets was to provide a lever for useful work it would not be of much help.

Dr D. E MASON (London) emphasised the need for extra diet in the early months of pregnancy.

Dr GRIFFITHS EVANS (Carnaervon) recalled the qualities of a good housewife—a quick eye, good sense of smell and curiosity The housecraft common in rural areas was not likely to be taught in welfare-centres

Dr H V P CONNICK (New South Wales) thought that every schoolgirl should receive compulsory teaching on food-values and cooking

Dr ALAN MONCRIEFF (London) spoke of the wide-spread ignorance of the medical profession on dietetics and thought that education of the doctor should come first Scientific experts must tell us simply the elements of a good diet There was need of propaganda for breast-feeding and control of the many misleading advertisements in the press was necessary

Dr M F J LOWENFELD (London) said that investigation was needed into the use of vegetarian diets

Dr ISABELLA LEITCH (Aberdeen) thought it important to remember that when cow's milk was diluted its calcium and vitamin content was diminished

Sir JOHN ORR, in reply, agreed with Professor Drummond that as calcium and phosphorus are adjusted the need for vitamin D gets less But the ebb and flow of minerals is not the same in properly fed people as in the undernourished Malnutrition in the population might be obscured as in the nineteenth century, where national physique had reached its lowest point, but the fact had been masked by advances in the control of disease

REVIEWS AND NOTICES OF BOOKS

The Study of Society

Methods and Problems Edited by F C BARTLETT, M GINSBERG, E J LINDGREN, and R H THOULESS London: Kegan Paul, Trench, Trübner and Co 1939 Pp 408 10*s* 6*d*

THIS book provides an excellent survey of the scientific methods available for research in social psychology Perhaps the most interesting thing about it is its method of production Four years ago the 17 contributors to its pages formed them selves into a discussion group, meeting at regular intervals Each member drafted his chapter, which was sent to all the other members and then criticised at a subsequent meeting As the writers themselves point out, the book provides a "practical rebuttal of the charge that when different psychologists, anthropologists, or sociologists deal with the same problem little but disagreement emerges" Some of the agreement, no doubt, is due to the *fact* that most of the writers were trained in the same university (Cambridge), and so represent the same school of thought The method, however, has been eminently successful, and it might profitably be adopted in other spheres

The underlying notion animating each contributor is that "the future of human civilisation depends upon man's capacity to understand the forces and factors controlling his own behaviour" Some of the chapters will be of special interest to medical men—for example, Mr J T MacCurdy's discussion of the relation of psychopathology to sociology, Miss Mary Collins's account of modern trends in child psychology, Dr C J C Earl's description of methods of assessing temperament and personality, and Miss Clement Brown's review of the methods of investigation that may be used by mental health workers Each chapter has a long but carefully selected set of references for further reading The authors repeatedly bring out the value of observa tions contributed by field workers who have direct access to information but no special training in sociology Among these the medical man finds a place, *for he obtains* incidental glimpses of social problems with an intimacy and from an angle to which no other observer can lay claim

Klinik der Lungenasbestose

By Dr HANS WILFRID WITDLER, assistant in the Medizinische Universitäts Klinik, Berlin Charité Leipzig Georg Thieme, 1939 Pp 152 RM 9 50

THIS monograph is one of a series on work and health published under the authority of the Reichs arbeitsministerium It consists primarily of a clinical, statistical and radiological record of the examination of 310 workers in two asbestos factories The workers were all ambulant cases and were examined at the clinic

The book contains introductory sections on the history, mineralogy and pathology of the subject, but these are very *brief* and even the *familiar* picture of the asbestosis body is omitted The 310 cases are classified according to the usual three stage radio-logical classification used for silicosis The results of the examination are as follows stage nought —i e, pre-stage one—240 persons, stage one, 46, stage two, 15, stage three, 9 The investigations made on the cases were intensive and included not only the usual clinical and radiological observations but examination of eyes, nose and throat, electro cardiograph records, &c Only 5 cases are recorded of asbestosis accompanied by tuberculosis and none of asbestosis and pulmonary carcinoma Only 5 deaths are recorded with 3 autopsies The length and type of exposure, together with the sex and age of the workers are given in a series of statistical tables, the whole supported with good X ray pictures There is a useful bibliography which contains a record of most of the now historic early work

The monograph is a valuable contribution to the subject, especially on the clinical side and praise is due for special investigations, such as blood-counts, sedimentation rates, examination of eyes, upper respiratory tract, and electrocardiographical records which have not been recorded, as far as we know, in most of the other series of asbestosis cases published

Bacteria in Relation to the Milk Supply

(2nd ed) By C H CHALMERS, B Sc Edin., N D A, formerly of the University, Leeds London: Edward Arnold and Co 1940 Pp 209 6*s*

WHILE there are many books on medical bacterio logy, there is room for reliable accounts of bacteria in relation to special subjects This applies particu-larly to milk, since bacteriology is important in its hygienic control, is used as an official check on the special designated milks and, in particular, is of great value in the *commercial control of milk* and dairy products generally Mr Chalmers's little book is a useful and valuable guide, mainly on the commercial side of milk control Part I describes the various routine methods of examining milk, the bacterio-logical examination of water taints and abnormal conditions in milk the bacteria which may be found in milk, and the control of the dairy plant Part II is concerned with general bacteriological technique and includes appendices on culture media stains, &c.

The section on water examination covers only nine pages; this is inadequate and should either be expanded or omitted altogether. The same applies to the brief and inadequate account of pathogenic organisms in milk and this might with advantage be omitted. The information as to the non-pathogenic organisms, such as the various lactic acid bacilli, is clear and reliable and might have been amplified, as reliable descriptions of these non-pathogenic organisms are not very readily available. These are minor questions of apportionment and the book as a whole can be recommended to all those interested in the bacteriology of milk; it should be particularly helpful to those commercially concerned in its regulation.

Modern Treatment in General Practice Year-book 1939

Edited by CECIL P. G. WAKELEY, D.Sc. Lond., F.R.C.S, F.R.S.E., senior surgeon, King's College Hospital, London. London: Medical Press and Circular. 1939. Pp. 365. 10*s.* 6*d.*

THIS book, intended for the general practitioner, divides itself into four parts. The first and largest portion deals with common conditions such as flat-feet, otitis media, "heart attacks," measles, and pyelitis in women and children; this section is of great value as recent views are clearly outlined. The second part, concerned with rare conditions such as acoustic-nerve tumours, blackwater fever, muscular dystrophies and cancer of the cæcum, will probably seldom be consulted. The third part considers conditions in which the treatment is unlikely to be in the hands of the family doctor—spina bifida, papilloma of the bladder, strabismus and slipped femoral epiphysis for example; nevertheless this section will help in the selection of suitable cases. The fourth part deals with the pitfalls in diagnosis. This year it concentrates on swellings—of the thyroid, breast, axilla, groin, neck and lower jaw. There are also six articles on the diagnosis of chest conditions.

The book is good value for half a guinea The contributors have dealt with their subjects in a practical and helpful way, and even the most eminent have avoided serving up old wine in new bottles. Its new title makes the book an annual; its successors will be welcome.

Evolution of Genetic Systems

By C. D. DARLINGTON, D.Sc.Lond., head of cytology department, John Innes Horticultural Institution London. Cambridge University Press. 1939. Pp. 149. 10*s.* 6*d.*

THE question which this book seeks to answer is how far the variation in genetic systems observable today throughout the world of animals and plants can enable us to reconstruct the steps in their past evolution. The "naked gene," which is supposed to exist in the ultramicroscopic virus, is held to be the prototype of the self-propagating chemical units of which are built the chromosomes and plastids of higher organisms. Asexual reproduction is made possible by mitosis of the chromosomes; fertilisation, meiosis and crossing over pave the way for haploid forms; the postponement of meiosis leads to diploid sexual forms; and from these can be visualised the development of polyploid, sub-sexual and sexually differentiated organisms. But reversions to asexuality are possible from all these stages.

Fundamental evolutionary problems are raised in the discussion of these transitions. The origin of meiosis and sexual reproduction, in particular, challenges the imagination; in Dr. Darlington's view, it presents the most violent discontinuity in all evolution. "It demands," he says, "not merely a sudden change, but a revolution It is impossible to imagine it as the result of a gradual accumulation of changes each one of which had a value as an adaptation either Lamarckian or Darwinian"

The book is a contribution to the philosophy of evolution. It presupposes an already extensive familiarity with the now elaborate terminology of chromosome structure and function. The author shows little gift for clear exposition, and his book, which is in no sense a textbook for the uninformed but interested public, makes difficult reading.

Photography by Infrared

By WALTER CLARK, Ph.D., F.I.C., F.R.P.S., Kodak Research Laboratories. London. Chapman and Hall. 1939. Pp. 397. 25*s.*

ALTHOUGH the possibility of photography by infra-red radiations has been known for half a century and Prof R W. Wood made excellent landscape photographs in this country by infra-red light nearly thirty years ago, it is only within the last decade that improvement in materials has made the process one of general application and popular interest This exceedingly useful book is the first comprehensive account in any language of the principles and practice of infra-red photography. Medical interest is catered for by chapters on medical infra-red photography and infra-red photomicrography. The process is of use in the study of the superficial veins (transparency of the skin to infra-red is appreciably increased by a superficial layer of oil or glycerine), photography of pathological specimens, examination of the iris in cases of corneal opacity, the measurement of the dark-adapted pupil, estimation of healing of lupus under its scab, transillumination, examination of the blood in CO poisoning, and the study of embryological and histological sections In dealing with infra-red photomicrography, such important practical questions as focusing and the choice of objectives and filters are adequately considered.

Other noteworthy chapters provide a useful description of the sensitising dyes that have made infra-red photography possible, and an exhaustive account, well illustrated and fully documented, of the numerous applications of the process in the arts, in science, and in industry. Two sections on photographic darkroom practice and characteristics of photographic materials will be useful to anyone interested in practical photography of any sort. Throughout the book the principles involved are always clearly discussed, but the emphasis is essentially practical—witness the full bibliography at the end of each chapter; the descriptions of all available materials—plates, films, lenses, filters; and the careful statement of the limitations of the process in particular instances The author explodes the popular impression that infra-red photography can increase visibility through fog dense enough to be a menace to navigation.

Altogether, this is a model work of its kind. Anyone who practises infra-red photography will find just the information he wants to perfect his technique; and anyone who wishes to try the process will obtain a fair estimate of its possibilities and also the practical knowledge to enable him to avoid the pitfalls that attend an untutored excursion beyond the visible spectrum.

THE LANCET

LONDON SATURDAY, AUGUST 12, 1939

THE INSANE SPOUSE

In two divorce cases decided at the end of July the respondent husband was certified as insane In neither case was the wife able to ask for a decree on the ground of incurable insanity, inasmuch as the husband had not been continuously detained under care and treatment for the full statutory period of five years In one case the ground was desertion, in the other it was cruelty The court had to consider whether insanity, by depriving the husband of the power to form an intention, gave him immunity against the charge of a matrimonial offence

In one of the cases (Williams v Williams) Mr Justice Langton held last March that a husband detained in a mental hospital could not be guilty of desertion In 1933 the Wallasey magistrates had granted Mrs Williams a maintenance order on the ground that her husband had deserted her and had wilfully neglected to provide for her reasonable maintenance In the following year Mr Williams was certified to be insane, he has been detained under restraint ever since Mrs Williams alleged that she had been deserted from 1933 onwards She was entitled to a divorce if she could establish three years' continuous desertion immediately preceding the date of her petition (Jan 21, 1938) Mr Justice Langton ruled that desertion, to constitute a matrimonial offence, must be a wilful and voluntary act, and that the husband was incapable (from June, 1934, onwards) of forming the necessary intention to desert his wife The Court of Appeal agrees, though not without hesitation and regret The de-facto severance of the marital relationship continues in the absence of some step directed to its restoration In the ordinary case the continuing existence of the intention to desert would be inferred, it could not be disproved without some definite step of the deserting spouse The intention to desert is presumed to continue unless the respondent proves 'genuine repentance and sincere and reasonable attempts to get his wife back." A person of unsound mind could not have the capacity to intend any such step, there could not be the quality of volition required to produce a legal result The Master of the Rolls confessed that, during the arguments, he had at one time thought it might be possible on the facts of a particular case to draw an inference what the conduct of the lunatic would have been if he or she had remained of sound mind But the Court of Appeal was satisfied that this was not a permissible solution The court could not assume what was impossible in law—namely, that the lunatic was capable of forming an intent, the court could not say that, if the lunatic had been capable, he would have acted in a particular way The Master of the Rolls added that the court's decision would in many cases involve grievous hardship Lunacy supervening the day before the presentation of the petition would deprive the deserted spouse of the chance of release This would be a capricious operation of the law as it stood, but it was a matter which could not be put right save by legislation Leave was granted to appeal to the House of Lords

In the second case (Astle v Astle) the wife alleged cruelty The parties were married in 1927 Three weeks later the husband began a series of violent and even murderous assaults upon his wife and other people After another month he was certified insane and was received into a mental hospital, suffering from acute mania His health then improved and he was allowed out on parole from time to time On one of these occasions (in 1927) he told his wife that he had intended to kill her and to commit suicide He returned to the hospital but was discharged some five months after his first admission His wife was afraid to live with him when he came out In 1931, being at liberty and not under certificate, he came to the house where his wife lived and threatened violence to her and her family In view of her past experience she felt such apprehension that she applied for police protection In 1937 the husband was again certified, he had been under restraint ever since The accepted tests of cruelty in a matrimonial case are almost exclusively concerned with the effect upon the victim It was conceded that Mrs Astle had been the victim of cruelty, if cruelty were to be judged only from the point of view of the party who suffered from the acts complained of Mr Justice Henn Collins came to the conclusion that the husband by reason of disease of the mind did not know the nature and quality of the acts which he committed in 1927, at the time when he was committing them If intention on the part of the actor was a necessary element of cruelty in a matrimonial suit, there would be no cruelty so far as the husband's conduct in 1927 was concerned But those acts did not stand alone There was the threat in 1931, uttered at a time when the husband was at liberty The court found significance in the fact that for the ten year period, from the husband's discharge from the asylum in 1927 until his readmission, he had been sufficiently master of himself to refrain from committing violence, so far as was known The judge held that in 1931 the husband knew that he was uttering threats against his wife and was consequently responsible in law for what he then did The question then arose whether the isolated act of 1931 was so grave as to justify a decree in the wife's favour From the wife's point of view it was an act with an antecedent history With her past experience in mind, the threat had a reality and force out of all proportion to what it would have had if the husband had not already made attacks upon her life The earlier conduct must be taken into account not as aggravating the quality of the single act of cruelty but as aggravating its consequences For those consequences the husband was responsible although the judge had felt bound to acquit him of the

acts which gave them their gravity. Mr. Justice Henn Collins held that the wife was entitled to the relief which she claimed He granted a decree *nisi of divorce.*

BIOPSY OF THE ENDOMETRIUM

GYNÆCOLOGICAL endocrinology has been criticised for its empiricism, and it is true that we do not yet know enough about the minute structure of the endometrium at various phases of the menstrual cycle to make our treatment precise Misunderstanding or misinterpretation of the pathology of the endometrium must take blame for the disappointing results of endocrine therapy, quite apart from the impurity or the inefficiency of some of the preparations on the market And yet we have a method whereby we can assess ovarian dysfunction and control the results of treatment Biopsy of the endometrium is no new thing in the United States, and ISRAEL and MAZER have lately published [1] its results over a period of three years in 305 patients, 160 parous and 145 nulliparous, ranging in age from nineteen to sixty-four In this series only 2 fleeting reactions occurred and HERRELL has endorsed [2] their view that "office curettage" is safe in the hands of a competent gynæcologist.

The technique is simple. The patient is placed in a modified lithotomy position in the examination chair, her legs supported by suitable knee-rests. No premedication or anæsthesia is required. After swabbing the external genitalia with a non-irritating antiseptic, a small speculum (e g , Sims') is inserted and held by an assistant while the operator grasps the cervix with a light pair of volsellum forceps. Previous bimanual examination will have eliminated obvious lesions in the pelvis and established the size, mobility and direction of the uterus. To confirm this a sound is now passed Passage of the internal os may give rise to a complaint of slight pain, localised to the lower mid-abdomen, the external os and cervical canal are apparently insensitive to instrumentation The sound having been withdrawn the curette is passed up to the region of the fundus, a strip of endometrium from which is most likely to give a picture of the general histology Various types of instrument have been devised; a dexterous operator with a good sense of touch may find his needs met by a miniature curette of the ordinary pattern, but in America preference has been given to a hollow instrument with suction, and a uterine aspirator of this kind was described by LORINCZ and DAVIS in this country a few months ago.[3] The patient is warned that she may have a slight spotting of hæmorrhage and that her menstrual period may be accelerated if its appointed time is almost due at the time of curettage.

The indications for biopsy of the endometrium are many. Firstly, all endocrinopathies where pituitary or ovarian dysfunction is suspect or manifest, for instance, those cases of functional hæmorrhage in which organic disease of uterus and adnexa has been excluded, and sterility, and amenorrhœa The physician, let us suppose, is consulted by a woman, complaining of sterility, whose husband has been tested and found to be normal, the patency of whose tubes has been demonstrated with Lipiodol and whose menstrual history is not grossly abnormal. Biopsy of the endometrium on the twenty-sixth day of her cycle may reveal secretory changes in the endometrium indicating that ovulation has occurred and that the corpus luteum is functionally adequate. This is a useful positive finding If, however, the biopsy shows no secretory changes we may assume that the corpus luteum is functionally inadequate or that ovulation has not occurred The concurrent estimation of the patient's excretion of pregnanediol glycuronidate in the same cycle provides an additional check on the findings of the biopsy, and vice versa Secondly, the biopsy affords an irrefutable criterion of the efficacy of a particular dose of an endocrine preparation in a particular case; thus 50,000 units of œstradiol benzoate given on alternate days for a week may be shown by subsequent biopsy to have induced no proliferative changes in the endometrium, whereas in the same patient over the same period of time 2 mg of stilbœstrol by mouth may be shown to have caused well-marked proliferative reaction

The contra-indications for biopsy should be clearly defined It is not suitable for nervous virgin nulliparæ; it should never be done if there is any acute infection of cervix, vagina or appendages It cannot be recommended for occasional use by the practitioner. Asepsis, skill and gentleness are essential. When, however, biopsy can properly be applied it saves the patient and the institution both money and time. Take the case of a woman attending an outpatient clinic who complains of sterility, after certain preliminary tests it is decided to perform a diagnostic curettage. She is placed on a waiting-list, which will undoubtedly be long, and as she is not regarded as an urgent case she may be put lower down on the list. Perhaps months later she is written for without reference to her menstrual cycle, and the chances are four to one that her admission does not coincide with the secretory phase She may then be sent out and written for again, the bed being meantime wasted, or a curettage may be performed at the wrong phase of her cycle Contrast a case treated by biopsy. The cost to the hospital is practically nil, the cost to the patient is her travelling expenses, and the time consumed a few minutes The cycle having been previously plotted, the day is chosen which will yield the desired information at the convenience of patient and surgeon. The reluctance to enter hospital is circumvented; the after-effects of an anæsthetic are avoided; the procedure can be repeated as often as is needed.

Office curettage will not appeal to everyone But those who are dissatisfied with the present results of endocrine therapy, and who still feel that it may be the right weapon if properly applied, will welcome a method of simplifying diagnosis and of assessing results

1 Israel, S L , Mazer, C , *Amer J Obstet Gynec* 1938, 36, 445
2 Herrell, W E , *Surg Gynec Obstet* Feb 1, 1939 p 249
3 Lorincz, B , and Davis, A , *Brit med J* 1939, 1, 261

MEDICINE IN KHARTOUM

In February, 1924, the Kitchener School of Medicine at Khartoum was opened On his last visit to the Sudan Lord Kitchener expressed a strong wish that medical training should be available for Sudanese students The proposal appealed strongly to the Sudanese and no less than £11,000 was subscribed by them towards the original scheme It soon became obvious that the students were not only extremely intelligent but also made efficient and reliable doctors The original object of the school was to turn out a small group of young men who could carry on the practice of medicine in the extremely trying climate of the Sudan The principle of the small group has been adhered to and as a result it may be doubted whether any medical students elsewhere in the world receive more individual tuition The report by Sir Alfred Webb-Johnson to the committee of management of the English Conjoint Board, mentioned elsewhere in this issue, gives an encouraging picture of the Kitchener school In its early days the school was fortunate in that Sir Henry Wellcome established in the Gordon College a group of laboratories for tropical agricultural and medical research It has now been wisely decided to separate these two branches The medical work is being carried on in the Stack laboratories close to the hospital and medical school, while the agricultural branch is at Medani in the Gezira where it is in immediate touch with the problems and difficulties which confront agriculturists in the Sudan Sir Alfred looks forward to the establishment of a university college in Khartoum embodying departments of arts, science, agriculture, engineering, veterinary science and medicine There can be little doubt that a movement will speedily develop for a university in Khartoum, and this deserves every encouragement With the decline of western academic influence in Egypt the importance of the Sudan as a cultural element in Africa may be expected to increase It therefore becomes doubly important that the development of a university at Khartoum should in no way be impeded

ANNOTATIONS

MORTALITY TREND IN DIPHTHERIA

Diphtheria, like other diseases spread by droplet infection, is probably quite as prevalent in this country today as it was forty years ago when compulsory notification was introduced During this period, however, certain other changes have taken place which have perhaps not received all the attention they deserve It appears that the spearhead of diphtheria's attack on child life has been moving gradually from the child of pre-school age to the child of school age Picken[1] two years ago, after pointing out that the earliest indication of this change was noted by Murphy[2] as long ago as 1907, showed that the shift of fatality to older children had continued—being particularly striking in London during 1932–35 He noted a similar change in Manchester and in Glasgow

Knowledge of this subject has now been put on a wider basis by Wright,[3] who has completed a valuable and comprehensive study of the clinical severity of diphtheria in seven cities (Liverpool Birmingham, Manchester, Glasgow, Leeds *Hull and Edinburgh*) over the period 1911–35 He finds that, though the incidence of diphtheria in the cities concerned shows fluctuation, there was a uniform and considerable decline in clinical severity as far as could be judged by case fatality rates During the final quinquennium (1931–35) of the study, however, the decline ceased, and in some places there was an increase in clinical severity which was independent of epidemics This general picture can be traced also within the various age groups of 0–4 years, 5–9 years and 10–14 years, but the decline in case fatality rates was proportionally less for the age group 5–9 than the age group 0–4 in all cities studied except Glasgow The shift of mortality to older children Picken was inclined to attribute to the more recently recognised type changes in the diphtheria bacillus itself Cheeseman, Martin and Russell[4] on the other hand have adduced evidence that reduction in the size of families, whereby children fail to encounter infection until school years, is primarily responsible, and improvement in the environment of young children also plays a part

Studies of this kind, apart from their value to the public health departments concerned, have general implications that should not be ignored If, as is suggested, the decline in clinical severity of diphtheria has now either ceased or been replaced by a rise, then a sharp stimulus towards active immunisation is required The well attested shift of mortality to older children also has a bearing on immunisation, indicating the desirability of immunising the child population as a whole, instead of concentrating on the very young

RADIOGRAPHY OF THE COLON

Examination of the several parts of the alimentary tract taxes the ingenuity of the radiologist The stomach and duodenum can be made empty by fasting, and their peristaltic movements are frequent enough for a series of pictures to be taken at short intervals after the barium meal when the changing contour of the opaque contents admits of diagnostic inferences When the rate of passage is quick, as it is through the small intestine, strial pictures may be obtained by using a thin barium impregnated paste For the colon the barium meal is supplemented by an opaque enema Both have their disadvantages By the time the barium meal reaches the colon it is mixed with residues of other meals, so that beyond the cæcum and ascending colon details of filling may be confused, and even for this part of the colon a supplementary opaque enema is needed The barium enema has the disadvantage of being given against the normal course of peristalsis, it may need a previous lavage of the colon to clear out food residues, moreover the ordinary movements of the colon are infrequent and spasm may confuse the picture In a recent study Rachet and Arnoux[1] point out that even two or three pictures taken at short intervals may not be really satisfactory for

1 Picken R M *Lancet* 1937 1 1141
2 Murphy S *Trans epidem Soc Lond* 1907–26 93
3 Wright H D *J Path Bact* July, 1939 p 13
4 Cheeseman E A Martin W J and Russell W T *J Hyg Camb* 1933 33 181

1 Rachet J and Arnoux J *Pr méd* July 8 1939 p 1043

diagnosis, nor do the methods of partial evacuation and air-insufflation preclude leaving a small lesion unnoticed. It is not often possible to have a further picture made within a few days or weeks; were this done opaque residues of a former barium meal would often be found in colonic diverticula. The authors therefore advocate taking a series of pictures while administering a drug which stimulates peristalsis. The technique they use requires lavage of the bowel with weak saline (15 per 1000) the previous night and early in the morning, a third wash of warm water being given if the second is not returned clear. The opaque enema, which must be quite homogeneous and of body temperature, is then given slowly under low pressure, air-inflation being used to distend the bowel. Twenty minutes earlier prostigmine has been injected subcutem to stimulate peristalsis. The patient lies in the same position for an hour during which exposures are made at intervals of ten minutes. By this method useful results have been obtained in the hands of the authors, who emphasise its help in precise diagnosis of the extent and operability, and even of the nature, of the lesion. It seems, however, that equally good results are obtained, with less strain on the patient and in shorter time, by proper orientation of X-ray tube, patient and plate, controlled by preliminary radioscopy and manipulation.

CONVULSION THERAPY AND ITS EFFECTS

MANY observations have now been made of the changes produced by Cardiazol in the brains of such animals as the guineapig, the rabbit, the cat and the dog, but the findings are less safely applicable to human beings than would be the results of similar studies in primates. Strecker, Alpers, Flaherty and Hughes[1] have now examined the brains of seven monkeys who had received intra-arterial injections of cardiazol in the doses and frequency usually employed in clinical work on schizophrenics. The experiment was intended to parallel closely cardiazol therapy, but there were divergencies, in that three of the animals died because of protracted convulsions, and in others seizures were of more than five minutes' duration, necessitating the injection of sodium Amytal to bring them to an end. In three animals no structural changes were found in the brain, in another there was swelling of the cytoplasm in the external granular layer of the frontal and parietal cortex, and in the remaining three subarachnoid hæmorrhage was observed over the cortex and at the base of the brain. Cells in the supra-optic nucleus of the hypothalamus showed in some of the animals loss of Nissl substance and vacuolation of nuclei. The investigators emphasise that those animals that had pathological changes in the brain had had, altogether, more minutes of active convulsion during the experimental period than the others, and that it had not been possible to demonstrate any subarachnoid hæmorrhage (by examination of the cerebrospinal fluid) in schizophrenic patients treated with cardiazol, probably because the duration of convulsions was so much less in them than it was in the monkeys. It seems likely, however, that it was not so much the total duration of the convulsions over the whole period of the experiment as the duration and severity of the individual convulsions that proved decisive in bringing on the rather gross changes found, in which case Strecker and his colleagues, instead of advising that the total number of treatments in a single case of schizophrenia should be limited to ten convulsions, might have taken it as the moral of their story that the dose of cardiazol given should never be such as to bring on a prolonged convulsion or, of course, repeated convulsions.

Any objection to cardiazol treatment based on the above findings and conclusions would presumably be raised still more strongly against picrotoxin, another convulsant drug recently introduced into the treatment of schizophrenia. A. A. Low[2] and his collaborators have tried this drug because they wished to avoid the terror of which patients complain after they have had cardiazol. Although picrotoxin can be used apparently without danger to life—they have given it to 38 patients intravenously, with no worse complications than subluxation of the jaw, dislocation of the shoulder, and fracture of the scapula—it is prone to cause repeated convulsions after a single injection. All but 2 of the 38 patients had at one time or another multiple paroxysms, and the patients who recovered were those who had fewer of these. From this it is concluded that the tendency to recover is in inverse proportion to a low convulsive threshold for the drug: no mention is made of the possibility that rapidly repeated convulsions may do cerebral damage of a kind unfavourable to recovery. Biochemical observations on the patients showed that the pH and CO_2 content of the blood, when two or more convulsions succeeded each other, tended to fall progressively with each paroxysm. Because of this the investigators decided to inject a barbiturate regularly after the second repeated convulsion to prevent further ones. It had also been observed that in the patients who had four immediately successive convulsions the sugar in the blood finally reached 210·4 mg. per 100 c.cm., and the white-cell count 34,300; the fasting level had not been restored an hour after the last seizure. In other respects the drug acted pretty much as cardiazol does, except that the patients found it less disagreeable, and there was an interval, longer even than that with triazol, between the injection and the first fit. On the whole, cardiazol seems preferable to picrotoxin.

BEST TEST FOR CLEAN MILK

SINCE 1929 a serious attempt has been made by the sanitary authorities in Italy to improve the cleanliness and safety of the milk-supply. The main test used in the control of bacterial cleanliness is the plate count. Increasing dissatisfaction, however, is being expressed with this method, and a search is being made for some more reliable substitute, among those receiving attention being the modified methylene-blue reduction test described by Wilson and his colleagues, now adopted officially for the grading of raw milk in England and Wales. Asdrubali[3] describes a careful examination of 120 samples of raw milk by means of the plate count, the Breed smear count, the modified reduction test, the keeping-quality test and the titratable-acidity test. The relation between the reduction test and the bacterial cleanliness of the milk as judged on the basis of the other four tests was then worked out. In 90 of the samples the plate count and the reduction tests were in good agreement. In the remaining 30 samples the results of the two tests were discordant, in 27 of these the reduction test gave the right and the plate count the wrong answer. Very striking were the results of the reduction and the keeping-

1 Strecker, E. A., Alpers, B. S., Flaherty, J. A., and Hughes, J., *Arch. Neurol. Psychiat. Chicago*, May, 1939, p. 996.

2 Low, A. A., Blanrock, M. F., Sachs, M., Wade, C., and Ross, E., *Ibid.*, April, 1939, p. 747.

3 Asdrubali, M., *Ann. Igiene (exper.)* 1939, 49, 218.

quality tests, the relationship between them proved almost linear Duplicate comparative tests made between the plate count and the reduction test on the same samples of milk by two or more workers yielded complete agreement in the reduction times, but often very great disagreement in the plate counts On the same sample of milk, for example, counts of 3000 and 400,000 were obtained Reviewing his results in the light of previous work the author concludes that, on account of its sensitivity, the constancy of its results, its low cost, its simplicity and the rapidity of its performance, the modified methylene-blue reduction test could be advantageously used to replace the present plate count in the examination of raw milk Ciani [4] has explored the possibilities of using the modified reduction test for controlling the bacterial cleanliness of pasteurised milk He examined 139 samples of pasteurised milk by the plate count, modified methylene blue reduction and keeping quality tests His results were similar to those of Asdrubali on raw milk He found that the plate count gave highly irregular results and showed a much lower degree of correlation with the keeping quality of the milk than did the reduction test From his experience during the past two years he is confident that the modified methylene blue reduction test could be satisfactorily used instead of the plate count to control the bacterial cleanliness of pasteurised milk His findings are of considerable interest, since Wilson and his colleagues were cautious in expressing their opinion on this point They did not regard the reduction test as suitable for the control of pasteurised milk immediately after processing, though they thought it might be used for testing the bacterial cleanliness of milk as delivered to the consumer It is presumably the latter type of milk with which Ciani has been mainly concerned, though his data on the time at which the samples were taken after processing are not explicit The general conclusion of both the Italian workers seems to be that for the control of raw and pasteurised milk of the quality at present supplied the modified methylene-blue reduction test has considerable advantages in the way of sensitivity, accuracy and simplicity over the plate count method

OPIUM IN THE FAR EAST

PREPARED opium, or opium to be used for smoking, has been engaging the serious attention of the advisory committee of the League of Nations which deals with the traffic in narcotic drugs It appears that at Hong Kong the opium sold by the monopoly amounts to only a twenty fifth of that sold illicitly, and that the high price charged for the former renders smuggling highly profitable thus confirming the finding of the commission of 1930 which reported on opium smoking in the Far East The question of prices is being studied by the British Government, in conjunction with the colonial authorities It will be remembered that a not inconsiderable proportion of the revenue of some of our far eastern colonies has been derived from the sale of opium

In Shanghai, according to the United States representative control of the traffic in opium has broken down completely except in the French concession and the International Settlement Huge quantities of Iranian opium are said to have arrived in Shanghai and in north and south China consigned to Japanese firms At the end of December, 1938 it was estimated that the amount of opium consumed daily in Shanghai was approximately 5000 taels of which 2000 were Iranian opium It was further alleged that the Mitsubishi Company had received instructions from Tokio to purchase 200 chests (18,907 kg) for Kwantung and 1600 chests (109,080 kg) for the Manchukuo government The sale of opium was the largest source of revenue in Manchukuo after the customs receipts The American representative also reported that all varieties of habit forming drugs are purchasable within the Japanese concession in Tientsin, where opium dens, in nominally Chinese controlled areas, abound The U S government, he said, have proof that heroin discovered in illicit traffic has since 1935 come in large measure from the Japanese concession Moreover, large seizures of *smoking opium (for which there is no* market in China), coming from the Far East, have recently been made in the States The representatives of India, Canada, Egypt and Belgium associated themselves with the expressions of grave concern regarding the situation The advisory committee noted with regret that there had been no improvement during the past year and proposed to communicate its report to the various governments

[4] Ciani G, Ibid, p 290

A DUTCHMAN LOOKS AT ENGLAND

Petrus Camper was born of wealthy parents at Leyden in the year 1722 He grew up in an atmosphere of cultured ease Boerhaave was a friend of the family and his father was a patron of the scholars and artists of the day He was entered at the University of Leyden in his twelfth year, but did not graduate in his chosen subjects, medicine, mathematics and physics, till he was twenty four He was no mean linguist and was able to speak and write French, German, English and Latin, and to understand Italian In 1746 Camper settled in Leyden as a general practitioner He was already specially interested in obstetrics, and in 1748 fired by eulogies of William Smellie, he determined to visit England with the express purpose of becoming one of Smellie's pupils

Smellie was then the most celebrated obstetrician of the day With William Hunter as his assistant he devoted much of his time to a series of lectures and demonstrations, which were attended by a stream of eager learners Camper at once placed himself under Smellie's tuition He paid the modest sum of three guineas for a three months course, and jotted down in a variety of languages an elaborate summary of the lectures, interspersing remarks of his own on what he heard, and often also what he spent and the names of those whom he met This constituted the first of his three diaries which have now been published [1] After his return to Holland he made a fair copy of the notes in Latin In the intervals of his attendance on Smellie, with whom he quickly became on intimate terms, he took lessons at a school of painting, at which leading artists gave instruction in life drawing One of his sketches of this period is reproduced in this volume and shows considerable artistic skill. Towards the end of his stay he made a series of excursions, visiting Oxford, Cambridge, Bath, Bristol and other places He was everywhere received by the learned men of the towns he visited, in Oxford and Cambridge he made friends with whom he corresponded for years He next went to Paris, but the records of his stay are meagre When he left Paris he found that he had in his absence been

[1] Opuscula Selecta Neerlandicorum de Arte Medica Ediderunt quinta-decima quam Curatores Musei Academici quae vocantur Nederlandsch Tijdschrift voor Geneeskunde collegerunt et ediderunt Amstelodami Societatis 1939 Pp 264

appointed to a professorship at the University of Franeker, and for the next few years devoted himself to teaching there

In 1752 he availed himself of the six-weeks vacation to pay a second visit to England. He took lodgings near Smellie and spent a great deal of his limited time working with him. He made a number of drawings for Smellie's book. The only relaxation he allowed himself from his medical studies was a visit to an old friend Dr Thomson of Worcester. He was soon back at work in Franeker, and three years later had gained so great a reputation that he was invited to Amsterdam as professor of anatomy and surgery. There he stayed for six years and then, at his own request, was relieved of his duties and retired to his wife's estate in Friesland with the title of honorarius. His retirement however did not last long, for in 1764 he accepted an offer of a chair in medicine, surgery, anatomy and botany at the University of Groningen. This he held for nearly ten years and then again retired from active teaching, though not apparently from practice or the enthusiastic study of natural science. At last in 1785, thirty-three years after his second visit, he again came to England, this time as a man of international reputation. He devoted the whole of his two months' stay to intercourse with the most distinguished men of science, who received him everywhere with the greatest warmth. He made many drawings of specimens of natural history at the British Museum, at Oxford and elsewhere, some of which are reproduced He was at this time greatly interested in the operation of symphysiotomy and one of the motives for his visit was the hope of inducing some of his English confrères to abandon their opposition to it. His last entry in the journal is both illustrative of his general interests and of his position in London. "In the evening I had the honour to be visited by Mr. West, his son and a friend, an American Quaker, who drank tea and punch with me. They inspected my drawings with intelligence, and seemed to like them . . . We discussed the nationality of Americans though of European blood We agreed that the distance from the eyelid to eyebrow was certainly small. That in Jews the nose is curved and flat at the point, the mouth drawn up, in one word that they show most resemblance to the goat's head" Camper was certainly an outstanding physician of his time and his English travels are of great interest both to our profession and to the general reader, and we owe a debt to our Dutch friends for making them available to us in this attractive book.

PHYSICAL EDUCATION FOR STUDENTS

ON July 19 the University of Edinburgh granted its first certificates for physical proficiency to two students who had taken the university course and examination in physical proficiency. This event marked a further stage in the campaign for making physical education an integral part of an academic university training As was noted recently in our columns,[1] Colonel Ronald Campbell, director of the university department of physical training, has been aiming at something other than mere athletic efficiency. In order to find out the state of mind of the hard-working student, the Colonel himself attended lectures in psychology, anatomy, physiology and moral philosophy This enabled him to plan a type of training which would revitalise the mind after a spell of mental concentration and put it once more into a receptive mood ready for the next class. That this empirical method was justified is shown by the results During the first few years of the scheme, nearly all the students who came to the gymnasium were members of the athletic club. Now there are as many if not more students who do not play games. At present about 20 per cent. of the men students are taking the voluntary course, which consists of not less than thirty classes in two consecutive sessions The tests used to assess physical ability are varied Agility is tested by running, jumping and vaulting, strength by gripping, climbing and lifting; and dexterity by throwing, catching and hitting The tests are adapted from those used in the Army, but are less specialised and more suitable for civilians of any age. Colonel Campbell considers that the average student who attends a class twice a week for four terms spread over two years should reach certificate standard, while the subnormal student should reach the required standard in three years It is claimed that students who gain most from the course are not necessarily those who obtain certificates Two large firms (Mather and Platt of Manchester and I C I.) have adopted the Edinburgh system of training for their apprentices and staffs.

SOIL POLLUTION

CESSPOOLS and privies are potential sources of pollution of both surface and subsoil waters and all who have to do with rural sanitation should read three papers[1] by Elfreda L Caldwell describing studies made at the field research laboratory of the Alabama department of health The pollution of a permeable subsoil from a pit latrine is first considered. To investigate this Miss Caldwell had a pit dug about 3 ft. square and 8½ ft deep in a fairly level field on a plain along the southern bank of the Conecuh River. The pit was sheathed with boards loose enough to permit outflow of sewage, and with two sampling wells dipping respectively about 3 and 4 feet below the bottom Eight encircling wells were also dug dipping about a foot below the bottom of the pit. The whole was covered with a layer of concrete, except for a central aperture in which the excreta of a family of nine were dumped daily. The general direction of flow of ground water was ascertained by preliminary experiments with strong salt solutions by a method described in one of the papers by Caldwell and Leland W. Parr, and across the line of flow were arranged a series of tube wells, some fixed, others driven in at places which the course of examination showed to be suitable Observations of the level of the water-table in the soil and suitable meteorological observations were made during a preliminary period of some months as well as in the period when excreta were added. During the preliminary period bacteriological and chemical analyses of the ground water drawn from the wells were made, and these were repeated at intervals during the experimental period The results illustrate the value of both bacteriological and chemical examinations, a point appreciated long ago by Houston Under varying conditions of water flow in the soil and height of water level chemical evidence of pollution was obtained 100 to 300 feet downstream in the soil water, the distance increasing as time went on. On the other hand bacteriological evidence was only obtainable for a few feet, the distance after a slight increase decreasing with time The probable explanation is the adsorption of bacteria and other particulate matter on the soil particles with consequent increase in efficiency of filtration Absence of dissolved oxygen

1. *Lancet*, July 8, 1939, p 106.

1 *J. infect Dis* 1938, 62, 225, 259, 272

in the soil water was a feature of the more polluted samples The value of bacteriological tests for indicating danger and of chemical tests for showing the possibility of bacteriological pollution are well brought out In the third paper Miss Caldwell studied subsoil pollution in relation to possible contamination of the ground water from human excreta deposited in experimental latrines, finding that pollution was normally in a downward direction, that it followed the direction of flow of water in the soil, and that it was much less from a pit used only for excreta than when water was added Obviously a dry system is safer than a leaky cesspool Sludge digestion, such as occurs in a septic tank, with consequent alteration of the bacterial flora of the peripheral layers in the pit, accounts for the small distance travelled by intestinal bacteria from the place of deposit Although the chemical substances indicating pollution are themselves harmless it would seem wrong, notwithstanding the way in which bacteria generally get held up in transit, to bore wells anywhere within the zone of soil water flow where chemical evidence of pollution is obtainable

THE PRINCIPLES OF FOOD HOARDING

In the crisis of last September as during the opening weeks of the late war, many well to do householders purchased, or attempted to purchase, large quantities of flour, bacon, sugar, tea and other commodities Because such action might have led to an immediate shortage of food, which would press more severely on the poor than on their more favoured brethren, it was stigmatised as "food hoarding" and frowned upon Retailers, either on their own initiative or upon prompting from the Government, refused to sell more to any household than this household had been accustomed to purchase in the past Food hoarding was definitely taboo In February, however, the President of the Board of Trade "saw no objection to the accumulation by householders in peace time of small reserves of suitable foodstuffs equivalent to about a week's normal requirements' and hoarding within these limits has become respectable, though until recently no serious attempt was made to tell the public what and how much they ought to store

Food storage has a double aspect—national and individual The national aspect has been dealt with in a publication of the Air Raid Defence League[1] which advocates storage in the land by accumulation of fertilisers, fodder and live stock, Government purchases of large stocks of wheat, sugar, oils and vital raw materials and the accumulation of stocks by wholesalers retailers institutions, and, when possible, householders The collection of a supply of wheat is recommended On the outbreak of a war shipping of fodder for animals would have to be drastically curtailed pigs and store cattle would be slaughtered for food, and reliance for meat would be placed on sheep not bullocks, though dairy cows would be retained for milk production The quickest return in food comes from cultivating potatoes and the next quickest from wheat whereas the production of milk is naturally much slower, and of beef slower still There is as yet little sign of preparation for a swing over to increased production of potatoes wheat and milk and no sign that the public mind is being prepared for such a change

What more concerns the average head of a family is the need for his household to lay in supplies of non perishable food The function of such hoarding is to tide the family over the period of dislocation of food supplies during the first week or fortnight of a war The well to do householder who lays in a week or two's needs as iron rations will do some thing to prevent the panicky purchase of extra food which accompanies a crisis or an actual outbreak of war Prices of foodstuffs will then be less likely to rise if he need make no immediate purchases and those who were unable to store food will not be penalised for their poverty or lack of accommodation The natural dislocation of food supply till the Government can take over food distribution will be minimised It is therefore reasonable for the householder to lay in a store of foods which will keep well and can be drawn upon to support his family during the early weeks of a possible war The British Medical Association has provided scientific advice[2] and the Lord Privy Seal has distributed some simple suggestions[3]

Foods which produce energy—and they are largely the storage products of plants or things manufactured from them—are naturally the ones which are least perishable, such as wheat, flour, biscuits, pulses and sugar The body building foods such as meat, fish, cheese, milk and eggs, are more perishable; and the protective foods, such as dairy foods, summer fruits and raw salad vegetables, are the most perishable of all Fortunately, as is shown by the discussion reported on p 373, there are methods of preservation which will leave some of these foods with their full value even after a year As sources of vitamin C we may recommend tinned black-currants and black-currant purée tinned tomato purée and tinned orange juice, but it would be well if the firms who put up the foods would take the public into their confidence about the amount of vitamin C in them expressed either absolutely or in terms of a day's ration Vitamins A and D in canned herrings, sardines and salmon probably keep indefinitely

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Dr A J CLARK, F R S, professor of materia medica in the University of Edinburgh, and Dr T R ELLIOTT F R S, emeritus professor of medicine in the University of London and consulting physician to University College Hospital have been appointed members of the Medical Research Council in succession to Prof H S Raper F R S, and Prof J A Ryle who retire on Sept 30

Mr FRANK ROMER who died in London on Monday at the age of 68 was well known for his successful treatment of athletic and sport injuries

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1 Food in War Time Air Raid Defence League 10, Great College Street S W 1 1939 6d

2 How to stack your A R P Larder Published by the British Medical Association B M A House, Tavistock Square London W C 1 1939 2d

3 Civil Defence Public Information Leaflet No 4 July 1939

THE LANCET 100 YEARS AGO

August 10, 1839, *p* 330

From "The Discovery of the Vital Principle," published anonymously

"The human mind by this time will comprehend, from the perusal of the preceding pages, how a remnant of the virtuous portion of mankind may be saved alive in the last day by the very powerful invention of balloons Ere the awful termination of the present abode of man, let us hope we may see the surrounding atmosphere spotted and illumined by moving vessels of every description, as we now behold them on the waters Here, then is excitement for genius and talent to unite in every possible way not a moment should be lost in devising the means of preservation from the impending, danger"

SPECIAL ARTICLES

"THE TEETH OF THE NATION ARE ROTTEN"

THE Minister of Health is informing the public that caries has the nation in its grip Last year, in opening the Public Health Services Congress, he said, "The teeth of this country are bad You might almost say the teeth of this country are rotten" A few weeks ago he repeated his grave statement. In his presidential address to the British Dental Association[1] on Aug. 1, Mr T. R. D. Walkinshaw took up the tale from the association's point of view. The problem, he admitted, was a very real one, but the blame must really be laid on our half-hearted public dental-health service. The body, if out of the care of the panel doctor for a year or so, does not inevitably decay. With the teeth, on the other hand, this unhappily seems to be the case. A dental service, to be of any value at all, must be continuous. Otherwise, in a couple of years away from the dentist, the value of hours of previous careful conservative labour is lost.

Officialdom has always been loth to admit that the nation has teeth which need caring for. Forty years ago, Mr. Walkinshaw said, at the outbreak of the Boer War, there was not a dentist in the whole of the British army. In the B.D A 's museum is a letter from the War Office replying to the late Captain A. F. A. Howe's offer of his services as a dentist to the troops in South Africa; in it the War Office stated that it was not necessary to send a dental officer to the front Yet it is on record that 2450 men were invalided home as unfit for further service, on account of dental disability, and that another 4500 were admitted to hospital and were later returned to nominal duty "to be kept within reach of soft food." Inspection of the mouths of one draft of soldiers revealed a serious condition of their teeth, and instead of the obvious remedy—dental treatment—the War Office gave orders for the immediate supply of mincing machines! Two large-size machines per company were therefore sent up from the base! It was some time after the end of the war that a feeble attempt to deal with the matter was made by the appointment of 9 dental surgeons, but, for economy, even this puny attempt at a dental service for the Forces was discontinued At the outbreak of the Great War the British army was again without a dental surgeon Eventually dentists were given temporary commissions in the R A M.C, and Mr Walkinshaw congratulated the B D A on its persistent efforts, which resulted in the establishment after the war of the Navy, Army and Air Force dental branches Unfortunately their conditions of service leave much to be desired and the number of recruits and trained men per dental officer is too high to permit of the maximum efficiency being achieved.

THE TEETH OF CHILDREN

The school dental service was started in 1908, yet now, although there are over 900 whole- and part-time school dentists, the dental condition of many school-children is little better than before Most school dental schemes are so seriously understaffed that there is little time for thorough conservative work and less for educative work. It is not the technical standard of the school dental service which is at fault, but the rushed conditions make anything approaching a true preventive service impossible. Last year the number of dentists in the school dental service was one for 6000 children, although the Board of Education suggests a ratio of one to 5000 children in urban areas and one to 4000 in rural The B.D A., however, holds that to ensure complete treatment there should be one dental surgeon to every 2500 children. Cambridge has one dentist per 2250 children; Croydon one per 5700 children; and another area one per 7000 children. In Cambridge practically every child was examined, 75 per cent needed treatment, and all but 2 per cent. received it. In Croydon 13 per cent. were not examined, and of those who were 75 per cent needed treatment which more than half of them never received. In the unnamed area only 41 per cent were examined and of these, strange to say, less than half were said to need treatment. This absurdly low figure is no doubt due partly to the shortage of staff and possibly to a lower standard of inspection being adopted in an effort to deal with the whole school population. In 1937 there were over 4½ million school-children in England and Wales About 3¼ million were dentally inspected, and of these approximately 2½ million required treatment, but only 1¼ million received it, so that about 1 million went untreated Assuming that of the 1 million who were not inspected the same proportion required treatment, then about 1¾ million who needed dental treatment did not receive it. Every year about 2½ million temporary teeth and more than half a million unsavable permanent teeth have to be extracted at school dental clinics The present service is now costing the country about £1,000,000 per annum To provide a complete school dental service on the present system it would apparently be necessary to spend twice this sum.

EARLY PREVENTIVE TREATMENT

Unfortunately the whole structure of the Board of Education's school dental treatment scheme, Mr. Walkinshaw thought, is built on a foundation of sand Immunity from dental disease can only be obtained by early preventive treatment. The effort must begin by attention to the health of expectant and nursing mothers, and the teeth of children under school age. The 1918 Maternity and Child Welfare Act provides that a local authority *may*—not *shall*—make arrangements for attending to the health of expectant and nursing mothers, and children who have not attained 5 years of age There are no statistics showing the number of authorities giving dental treatment for expectant and nursing mothers and young children, although steps are being taken by the Ministry of Health to require local authorities to submit details In the north of England at least, provision of dental treatment for mothers and children is conspicuous by its inadequacy or entire absence Until the problem of the pre-school child's dental health is tackled, the dental treatment in the school services will be handicapped and retarded If the pre-school child received dental attention, the school dental officer's work would become more effective and gross irregularities due to early loss of deciduous teeth would be greatly reduced The average child entering school has teeth in an appalling condition, so that during the first few years of school life the time devoted to dental treatment is largely taken up with removal of septic temporary molars

Besides the failure to provide adequate dental treatment in nursery schools there is the failure to provide dental treatment during adolescence in the gap

1 *Brit dent J* 1939, 67, 115

between school leaving age and entry upon insurance benefit At its least the gap appears to be two and a half years, and in some approved societies dental letters are certainly not issued to members until they have been contributors for five years In such circumstances a child leaving school at 14 is not eligible for dental benefit for seven years Adolescence is known to every practising dentist as the age when dental caries is most active, and when periodic attention to the teeth is more necessary than during any other period of life The recent Juvenile Contributors' Act provides that a child at the age of 14 or more years, on entering an insurable occupation, shall at once be entitled to statutory *medical* benefit, but so far no provision has been made to include dental treatment, although on the second reading the Minister undertook to examine the possibility of reducing the waiting period to one year Anything, said Mr Walkinshaw, more wasteful than the institution of a system of dental treatment given throughout the school life and then allowed to drop entirely during the period of adolescence would be difficult to imagine The net result of all this is that when the ex school child has reached maturity the conservative work of the school service is entirely nullified and the money spent by the state largely wasted Those who examine the teeth of recruits to the Navy, Army and Air Force today say that what they see makes it difficult to believe a school dental service has been in existence for thirty years, it is rare to find any evidence that these men have ever received dental attention

A BREAKDOWN SERVICE

Dental benefit under National Health Insurance has the unenviable title of a breakdown service As an additional benefit, it is dependent upon the existence of a surplus Approved societies having a large sickness claim have little surplus, and the very people who need dental treatment most cannot get it as a benefit The vast majority of societies offer only 50 per cent, leaving the insured person to pay the balance—often a difficulty for the adult wage earner, and an impossibility for the insured adolescent Unlike medical benefit it is not statutory, and dental benefit is sought only on medical advice or for the relief of pain Further there is no regular inspection and treatment, and the approved societies often raise difficulties when insured persons apply frequently for dental letters Prophylactic and conservative treatment is discouraged, and it is estimated that over 80 per cent of the annual expenditure on dental benefit under the N H I Act is represented by the cost of extractions and dentures This costs the nation about £2,000 000 per annum, apart from the proportion paid by the patients themselves, and achieves said Mr Walkinshaw nothing as a contribution to health and fitness in the young men and women of the nation, who will be the parents of the next generation If the teeth of the nation are rotten " then no one should be better aware of that fact than the Minister of Health, whose department, in conjunction with the Board of Education must share the responsibility of their failure to exercise the wide powers both possess

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THE number of inquests held by coroners in the county of London continues to decrease, and the L C C consider that the number of coroners' districts should be reduced from six to five The coroners of London agree with this view If the Secretary of State approves the existing central and the southern districts will disappear and a new south western district will be created The new arrangement will save about £1700 a year in salaries

KITCHENER SCHOOL OF MEDICINE, KHARTOUM

AT the request of the committee of management of the English Conjoint Board, Sir Alfred Webb Johnson visited the Kitchener School of Medicine at Khartoum during the final examinations in January, 1939 In his report he stated that, in addition to the care of the sick, the Sudan Medical Department shoulders the responsibility not only of controlling endemic and epidemic infective diseases but also of guarding against importation of infections from across the frontiers Perpetual war is waged against the insect vectors of infecting agents and the keenest vigilance is exercised over the steady stream of aircraft which bring distant countries within a few hours' journey of the Sudan These considerations influence the teaching in the medical school, they lead to a close link between therapeutic and preventive medicine The doctors are supplemented by a host of subsidiary officers working in native villages where, for economic, social and psychological reasons, no qualified medical man could be expected to live In dispensaries and dressing stations these subsidiary officers, who have had considerable training as hospital orderlies and have passed a special examination act as outposts for the treatment of minor ailments and as scouts to give warning of suspected infection Inspection of these units, which are all based on general hospitals, showed the system to be satisfactory and effective and definitely preferable to peripatetic mobile units paying occasional visits to various districts

EDUCATION AND EXAMINATIONS

Last year it was arranged for the first time for the pupils of Gordon College to enter for the Cambridge School Certificate Slight modifications were very sensibly made to meet local conditions Arabic took the place of English as the native tongue and English was counted as a foreign language and was made an obligatory subject Of the 22 pupils entered for the examination 20 gained the certificate, and 16 reached matriculation standard

The students for the medical school are selected from among the most successful pupils of Gordon College, they are given their medical education without charge, they have to live in a students' hostel for which again no charge is made, and they are given an allowance of £E1 per month Inefficient students are weeded out in the preliminary and intermediate parts of their training The new students admitted in any one year are never allowed to exceed ten in number The original objective was to reinforce the Sudan Medical Service by about six newly qualified doctors each year At present about half this number is attained. The limitation of numbers leads to a high standard of individual tuition The students work very hard, and never require any stimulating —on the contrary the Registrar has to insist on a less serious concentration on reading

THE FINAL EXAMINATION AND THE POSTGRADUATE

It was a unique experience for an examiner to find that, of seven candidates taking all three clinical subjects at one time only one failed to obtain a pass mark and then only in one part of the examination The pass mark was 60 per cent and the standard was severe There is no clinical examination in obstetrics but this will be arranged for at the next examination The papers were very legibly

written and the English was well composed and spelling good. This is largely the result of the excellent teaching at Gordon College. Instruction in English is to be continued in future during the two science study years, so that an even higher standard is expected. The viva-voce answers were clear, straightforward, and to the point, and the candidates were quick and ready in discussion The students are well trained in clinical methods, they examined patients very thoroughly and methodically. They displayed a refreshing reliance on careful clinical examination instead of making an immediate demand for X-ray and laboratory assistance before attempting a diagnosis.

Successful candidates are enrolled in the government service, but before being appointed to independent posts they have to serve for two years as resident house officers at one of the large general hospitals. After ten years they must return to Khartoum for six months' postgraduate study. The fear that so much individual tuition may produce doctors who are not sufficiently self-reliant has, in the judgment of those in control, proved absolutely groundless

THE MEDICAL SCHOOL AND LABORATORIES

The medical school is well equipped and the laboratories are excellent in every way. There is a good library, which is more than adequate for the needs of the students, but, as it is hoped to make it a circulating library for the officers of the service, gifts of books will be greatly appreciated In the Stack laboratories, instruction is given in pathology, bacteriology and parasitology, the routine work of the hospitals is carried out, and special investigations are made if required from any part of the Sudan. In addition, lymph for vaccination against smallpox is prepared, as well as anti-rabies vaccine and many other protective inoculations. A large amount of research work is carried out, and the department is directed by Dr E. S. Horgan. A railway coach has been equipped as a mobile laboratory.

MATERNITY WORK

Owing to national customs and prejudices it is difficult for the students to attend maternity cases in patients' homes, but the number of deliveries they see and actually attend is steadily increasing There is an admirable school of native midwives which is conducted at Omdurman Two British ladies, qualified as nurses and midwives, here instruct native women in the essentials of efficient and cleanly maternity work An antenatal clinic is held at the school, and the pupils are taken out to cases after preliminary instruction in theory and practice. Most of the pupils have never even seen a pair of scissors, and have to be instructed in their use, so that it is astounding that they can be trained as useful midwives for outlying country districts in so short a time as six months.

THE FUTURE

Great developments are planned for the improvement of education in the Sudan Gordon College, which was originally a vocational primary school, has grown into a vocational secondary school. Its pupils are to be moved to new buildings to the north of Omdurman and at Medani The college buildings will then be available for centralising the several departments of advanced education which have developed in different parts of Khartoum A centre of university-college standard will thus be established. The departments of arts, science, agriculture, engineering, and veterinary science and the Kitchener School of Medicine should all be brought under the control of this centre, which would soon develop a university spirit Any delay in carrying out this natural development will only be putting the brake on the inevitable Immediate steps therefore should be taken to perfect an organisation so that, directly the buildings of Gordon College are available, the Gordon University College can be launched No doubt this will soon be followed by a movement for the establishment of a university in Khartoum, and this movement should be encouraged in every way.

In the hospitals of Khartoum and Omdurman there is bed accommodation for 650 patients; the number is shortly to be increased to 750 The old hospital on the river front, which is some distance from the medical school, is to be demolished. The director's offices are to be moved into the present civil hospital next to the medical school, and a new hospital is to be built on the eastern part of the site Thus a 500-bed hospital will be erected in the immediate vicinity of the Stack laboratories and the medical school with great advantage to medical education. With the special women's hospital and the new men's hospital at Omdurman and the hospital in Khartoum there is ample opportunity for clinical instruction and practice.

RESULT OF THE REPORT

The comitia of the Royal College of Physicians of London and the council of the Royal College of Surgeons of England have adopted the following recommendations, suggested by the committee of management on Sir Alfred Webb-Johnson's report:—

1 That, subject to a special recommendation from the Director of the Sudan Medical Services, a graduate of the Kitchener School of Medicine, Khartoum, who has completed not less than two years' hospital experience subsequent to qualification, be exempted from the First Examination and be admitted to the Final L.R.C.P., M.R.C.S. Examination on completion of twelve months' practice in a recognised medical school and hospital in this country

2. That a graduate of the Kitchener School of Medicine, Khartoum, be admissible to the examinations for the several postgraduate diplomas granted jointly by the Royal Colleges on complying with the regulations for admission to these examinations.

NEW ZEALAND

(FROM OUR OWN CORRESPONDENT)

SOCIAL SECURITY AND THE DOCTORS

THE present lull in the contest between the Government and the medical profession, organised as the British Medical Association, affords an opportunity to review the situation About August, 1938, the first Labour Government, towards the close of its third and last year of office, passed its Social Security Bill This bill had two main objects It was intended to substitute for the existing non-contributory civil pensions, monetary benefits on a contributory basis. It also provided for a system of medical, hospital, and related benefits The money was to come from a new social-security tax of 1s. in the pound, payable by practically everyone in the community; it replaced the old unemployment levy of 8d in the pound, payable by a more limited clientele. The social-security tax came into force on April 1, 1939, and is being regularly collected. The medical benefits were to consist of a general-

practitioner service available to every person in the community Maternity benefits available to all were limited to such service as a general practitioner ordinarily gave Pharmaceutical benefits were to include all ordinary prescriptions and appliances Hospital benefits were to consist of the payment to the hospital (whether public or private) of part of the fees charged to the patient Actually this sum has been fixed at 6s per day (public hospitals charge about 15s a day) and payments began on July 1, 1939 Apart from these four benefits, the bill fore shadowed, but did not provide for, a number of others, for example radiological, laboratory, anæsthetic, specialist and consultant, dental, ambulance, home nursing and domestic assistance

The New Zealand branch of the B M A is the only important organisation of medical practitioners in the islands, and includes about 90 per cent of all doctors on its roll All sections of the profession belong, including consultants who figure prominently as local and national officers The B M A for several years had been studying forms of health insurance and had, long before the Social Security Bill was passed, adopted and published its official plan This plan outlined a scheme of service for the more needy, though an income-limit was never actually fixed The service was to be a complete one, including general practitioner, specialist, consultant, radiological, laboratory and other services with emphasis on preventive medicine The G P section was to be organised on a "panel" basis and the other services on part time paid attendances by consultants at hospitals or elsewhere It was generally recognised that, owing to the more equal distribution of wealth in New Zealand, any wage limit likely to be agreed to by the Government would include 70 or 80 per cent of the people in the scheme

In the months preceding the passage of the bill, there were numerous conferences between ministers, officials of Health Department, and B M.A repre sentatives These conferences were largely abortive, the B M A representatives insisting that the Government would never disclose their intentions as to the kind of service proposed, and further that the Government had not had expert advice on either actuarial or medical aspects, they therefore could not offer to coöperate It was said that the bill was actually passed before the B M A representatives were informed of its contents A deadlock was thus reached, the B M A refusing to discuss the matter further and calling upon all its members to sign declarations vesting in their local representatives their right to accept or refuse contracts offered These declarations were signed by a goodly majority of practitioners, and donations were collected for a fighting fund Everything then seemed to depend on the result of the General Election in October, 1938 If the Labour Party went out, the B M A 's fears would perhaps be at an end (although it was remembered that the National Party had on its programme a national health scheme before it went out of office in 1935) If it did not, no one cared to think about it Social security was a prominent feature of the election campaign After a hot election, in which the medical profession was used in the attempt to defeat the Government, the Labour Party was returned to power stronger than ever, with an absolute majority in the House When the summer holidays were over in January, 1939, the Minister of Health, the Hon Peter Fraser, reopened negotiations with the B M A to try to get the bill working as promised on April 1, 1939 The deadlock continued, as the B M A refused to exercise its rights in sending members to the central medical committee In March the minister circulated documents to medical practitioners describing the bill and its benefits The rate of remuneration for G P service was not specified, nor its manner of distribution It was simply to come from a central practitioners' fund, which was to be formed either on a capitation basis, or on an estimated amount of service basis Many general practitioners feared the panel basis, even as promulgated by the B M A, and began to press for "payment for services rendered," for which certain ministerial statements seemed to give encouragement

In April it was announced that a beginning would be made with the maternity benefits and an offer of contract was communicated to all practitioners by the minister Only 22 in the whole of New Zealand accepted the contract, the terms of which were generally held to be very irksome to both practitioner and patient It was also objected that there was no provision for consultant help, and some thought the fee of £5 per confinement with attendance before and after was inadequate The B M A expressed approval, as an alternative of a cash payment to the mother, allowing medical arrangements to go on as at present Maternity benefits, as far as they concern nursing homes, are now in operation, together with the medical portion served by the 22 doctors Hospital benefits began in July There is at present (mid-July) a lull on all fronts There is no word of the introduction of medical (G P) or pharmaceutical benefits Meanwhile the minister of finance continues his prolonged conferences in London with Mr Montagu Norman and other authorities, and the country awaits word as to length of rope to be allowed

Quot homines, tot sententiæ Neither side seems to have done much serious thinking about the medical problem in New Zealand The public hospitals are in a low state of efficiency and cling to the ectopic honorary system which has never been suitable for New Zealand The hospital boards, elected locally, have always been of poor calibre and lack coördination on a national basis The profession while individually fairly competent, lacks leaders of vision and insight, having exported its best medical and scientific brains for many years past It can claim practically no output of thought or research, and is content to retail the work of others It makes no effort at public enlightenment, preventive medicine, or fruitful contacts with education, agriculture, or social life generally The Government show no outward sign of enlightenment in medical matters Their proposals are devoid of inspiration, and seem to aim at reorganising the mode of distribution of medical services, accepting their present quality as satisfactory The approach is evidently almost purely political, and this is probably the reason for their inability hitherto to think of reorganising the hospital system of the country This reform is the first necessity But to carry it out would mean shaking the entrenched system of local politics The people are not very vocal Certain women's organisations pass resolutions supporting the doctors, but there are many signs of dissatisfaction with the status quo Individually doctors are liked, but as a body they are a popular target The large public hospitals are openly acknowledged to be bad by the general public Conditions of medical service in rural areas fall very far short of what they might easily be, through lack of organisation There is a mild general scepticism as to the value of the social security benefits, but the tax is collected, and the

people will want to see something for their money The outcome is hard to visualise. Politics will have to be given less importance by both sides if useful progress is to be made. Perhaps however a world-wide cataclysm will overwhelm all traces of this little controversy.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENT)

EPIDEMIOLOGY OF VIRUS DISEASES

In a paper read at the annual conference of health officers and public-health nurses of New York state Prof John E. Gordon of Harvard calls attention to the differences in the epidemiology of virus and bacterial infections. Several hundred virus diseases have now been described—almost no form of life is free from them—and the remarkable increase of information about the filtrable viruses during the past ten years has changed our ideas about the spread of infection Professor Gordon points out that the fact that viruses are filtrable and invisible agents limits the application of certain common epidemiological methods On the other hand, viruses are obligatory intracellular parasites and this sets a boundary to their activities and governs their behaviour. We cannot tell whether they are autocatalytic agents or living organisms, and the question has been raised whether we can control the infectious diseases for which they are responsible if they are fabricated in the host. Professor Gordon contends that this fear is a bogy: there is no more reason to believe in spontaneous generation of viruses than there was to believe in the spontaneous generation of bacteria in the time of Pasteur. The epidemiology of the virus diseases resembles that of other obligatory parasites. A few of them are transmitted by direct contact, a large group by droplet infection and many by the bites of insects The susceptibility of different organs to viruses varies, thus they rarely affect the gastro-intestinal tract

Biological variation of the filtrable viruses can be accomplished by a wide variety of experimental methods and is put to practical use in the development of vaccines for active immunisation. There is still room for research on the extent to which such variation is related to the genesis and behaviour of epidemics and to the question of supposedly new virus diseases Adaptation of a virus to different cells and to a different host gives essentially a different disease. Infections which are latent in one host may produce highly virulent and fatal disease in another As in the case of psittacosis, the virus of an established animal disease may give rise to accidental sporadic infections in man, and what appears to be a new disease in man may be a well-recognised infection in other hosts Most viruses have a preferred host, but they invade foreign hosts more commonly than is realised and when this happens they often do strange things

Epidemiology made great progress with the development of the doctrine of latent infection. In virus diseases we have wide variations in clinical effect depending on the host, and we have atypical infections merging into subclinical or latent infections Below the level of subclinical disease we also have levels of severity of infection. For some diseases prolonged and permanent latency has been demonstrated. Latent infection is nature's method for the control of contagious disease, a condition in which there is low fatality and permanent immunity. By this means nature assures the survival of both host and parasite, for nature has no favourites Probably 80 per cent. of infections with poliomyelitis are latent or subclinical infections. The importance of the carrier in virus diseases remains to be determined by adequate field studies We know that in virus diseases solid immunity follows many infections. One explanation of this is that permanent immunity is the result of latency Another possibility is that immunity is maintained by repeated exposure to infection Intracellular parasitism favours a lifelong latency.

In the control of the virus diseases little is to be expected from isolation and quarantine. Much more hopeful are specific methods of immunisation such as have been applied in smallpox, rabies and yellow fever. Progress may also come through the study of host-susceptibility. The method of blockage developed for poliomyelitis has been disappointing in practical results but represents a useful idea

Professor Gordon thinks there is every reason to be optimistic about the chances of controlling the virus diseases, and the successes of the past ten years encourage him to believe that we are in the first stages of an epoch which bids fair to rival the era of bacteriology of the past fifty years

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

EMERGENCY HOSPITALS IN SCOTLAND

Last week Mr John Colville, Secretary of State for Scotland, opened the first new hospital hut annexe in Scotland in the grounds of the Astley Ainslie Institution, Edinburgh Twelve days before the hut was declared open the ground had been a vegetable garden. Mr Colville said that this was the first of 3 such annexes to be built on the institution grounds, and the first of 170 to be built in various parts of Scotland These would provide 7000 beds for use in time of national emergency, but it was hoped that a big proportion would also serve peace time needs Another 3000 beds would be provided in five completely new hospitals, each having 600 beds and capable of being expanded, if necessary, to 1200 beds The plans were being standardised and hutted annexes would soon be completed in rapid succession throughout the country Each ward unit would have the sanitary and other accommodations necessary for hospital purposes. Other units would be built to accommodate twin operating-theatres, X-ray and other equipment. Some would have preferred the buildings to be more permanent but this was an emergency job and required speed in completion and something had therefore to be sacrificed In addition, about 20 existing hospitals were being adapted to the functions they were to serve in the emergency scheme. This adaptation included the provision of new theatres, X-ray rooms and the extension of kitchens. Private individuals were also coöperating Many large houses in Scotland had been offered and 100 of them had been so far earmarked for the hospital scheme About 15,000 women were needed for emergency nursing training So far about 5000 had volunteered Of these Edinburgh had contributed 700, Glasgow 900, Aberdeen between 300 and 400, and Dundee 350 Other parts of Scotland generally show less satisfactory figures.

IMPROVED CONDITIONS FOR NURSES

The Department of Health for Scotland is urging local authorities to make nursing a more attractive profession. The difficulty of providing a separate

room for each nurse in older hospitals may be solved by allowing trained nurses to live out, adequate lodging allowances being paid. Probationer nurses ought to live in nurses' homes but these should be detached from the hospitals and run more as hostels. Nursing staffs should be relieved of domestic duties which could be performed by ward maids or orderlies so as to remove the reproach that probationers are used as cheap domestic labour. Old-fashioned restrictions should be relaxed. Holiday time tables should be constructed in advance so that nurses may have proper notice of their off duty and vacation periods. Probationers should have three weeks holiday and trained nurses four weeks each year. The monotony of food for nurses in many hospitals could be improved by better service of meals, a choice of dishes and a trained cook. The care of the nurses' health is of great importance. Routine medical examinations should take place periodically during training and on appointment to the trained nursing staff, and every nurse confined to bed or absent from duty for more than 24 hours should be examined by a medical officer.

PUBLIC HEALTH

Health Indices

ONE of the functions of national institutes of hygiene is, in the opinion of the Health Organisation of the League of Nations, to stimulate and coördinate local health activity. For this purpose they should gather data indicating the nature of local hygienic and social problems and the extent to which they are being tackled. They should also be able to compare their findings with similar information gathered in other countries. Out of General conferences of directors of institutes and schools of hygiene has grown a scheme for collecting data of this kind, culminating in the appointment last October of a committee on health indices. This committee has now drawn up a skeleton standard form of report suitable for both local and central use in each country (*Bull. Hlth. Org. L.o.N.* 1939, 8, 60 (Extract No. 2)). It is subdivided into three main parts concerned with (1) vitality and health, (2) environment, and (3) public health activity. In part 1 demographic statistics and accounts of the usual kind are required—i.e. population figures, reproduction data and morbidity and mortality rates, both general and specific as to age, sex and some causes. Environmental indices (part 2) are classified under two main headings, external and social, the former are concerned with meteorological, housing, sanitary and dietetic conditions, the latter with occupational, industrial, agricultural and educational facilities and practices and with public utilities of various kinds. In the third part an attempt is made to stereotype indices measuring the provision through governmental, voluntary and private channels for the public health and social service—i.e., personnel and equipment, medicosocial activity and social welfare (insurance, pensions and public assistance).

The plan is on the whole well designed. If the information asked for is sometimes somewhat sketchy, the drafters had in mind no doubt, the limited capacity of small administrative units, especially in rural areas, to furnish more informative particulars. (Presumably, where rates only are mentioned, it is intended to be understood that the actual numbers on which these rates are calculated will be welcome additional information.) Repetition of statistics not readily available each year such as census data, is not expected but reference should be given to any previous report in which they have appeared.

In judging the value of this scheme in relation to our own system its origin should be remembered. It seems to be intended mainly as a guide for those countries in which institutes of hygiene are closely linked with government departments and exercise large functions for them (*Lancet*, 1938, 2, 1244). In this country most of the information is contained in the central reports of the Ministry of Health and the chief medical officer of the Ministry and the Board of Education (in the preparation of which the staff of the London School of Hygiene have a part), and locally in the annual reports of medical officers of health and school medical officers. The arrangement of the subject-matter is different because the origins, administration and finance of the several parts of our health service govern the form in which particulars are given. Some of the national and local data are published only in the *Annual Statistical Review* of the Registrar General and are not readily available for local study until long after the report of the medical officer of health is in print. Localisation of some of the information—as regards factory inspection for example—would serve little purpose under the existing central administration of this service, and such figures as the rates of sickness among insured persons are not locally ascertainable in a scheme worked through approved societies.

It seems unlikely, therefore, that our own practice will be much affected by these proposals, but they deserve careful examination by central and local departments which issue annual reports. Each year the Ministry of Health and the Board of Education call for prescribed information to be furnished by medical officers of health and school medical officers. There is now much greater uniformity in the form of local reports than there used to be, but they could be improved in this respect, for purposes of extract and comparison, without destroying the local effect of individuality in their terms of expression.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 29, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1816; diphtheria 893; enteric fever, 19 (5.2 "expected"); pneumonia (primary or influenzal), 415; puerperal pyrexia, 105; cerebrospinal fever, 25; acute poliomyelitis 23; acute polioencephalitis 2; encephalitis lethargica, 4; dysentery, 65; ophthalmia neonatorum 106. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Aug. 4 was 2741, which included scarlet fever 715, diphtheria 501, enteric 19, measles, 14, whooping-cough 664, puerperal fever 1 mother (plus 1 baby), encephalitis lethargica, 30, poliomyelitis, 13. At St. Margaret's Hospital there were 19 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from smallpox, 1 (0) from enteric fever, 1 (0) from measles, 1 (1) from scarlet fever, 0 (0) from whooping-cough, 20 (0) from diphtheria, 71 (9) from diarrhœa and enteritis under two years, and 12 (0) from influenza. The figures in parentheses are those for London itself.

Southampton had the only typhoid death. Birmingham reported 2 deaths from whooping-cough, fatal cases of diphtheria were scattered over 18 great towns. Wallasey reporting 2 and Plymouth 2.

The number of stillbirths notified during the week was 277 (corresponding to a rate of 40 per 1000 total births), including 42 in London.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM DOCTOR DON

II

THE attempt to unite on one occasion an industrial congress, a scientific association and a wakes' week seems foredoomed to failure and B.M.A. meetings in the past have often deserved the criticisms which Cronin has so generously and so cleverly meted out to them in "The Citadel." The various travelling clubs such as the surgeons and the medical pilgrims, which are small enough to receive and return private hospitality, probably represent the maximum size of a unit which can properly combine business with pleasure, while societies such as the Pathological Society and the Association of Physicians, with a turn-up between 150 and 200, are near the limits for effective scientific meeting and discussion There is much work in medical sociology which requires the machinery of delegates and representative meetings, and is not out of keeping with the pomp of civic hospitality, academic robes and press reports, and this seems to me the proper future of B M A. meetings.

Bournemouth probably saw the peak of lavishness on the entertainment side and at subsequent meetings a brake has been put on the tendency to mass junketing. No class in our society can stand the temptation of something for nothing or behave decorously when the individual is merged in a group. For this reason my blood—which is admittedly a volatile fluid—always boils when members of the set amongst whom I move refer to "the people" as if they were beings of a different order, suggesting, for example, that conscription is a good thing because it will instil some discipline into "the people" I remember that it was a crowd of doctors and their wives who stormed Blenheim Palace in 1936 without tickets in the worst White City tradition, and that it was a party of Hellenic Cruisers, composed of old public-school boys and university graduates, who carried out one of the biggest examples of litter-leaving of recent years in an ancient Greek theatre. The best thing that can be said about conscription is that it is a measure of democratic education, and that it may do something to redress the wrong that Arnold of Rugby and his disciples committed when they made a certain type of education a social cachet and a badge of parental good fortune But the rise and fall of public-school education is a King Charles' head which I must keep out at all cost.

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To return to Aberdeen after these unflattering references to the medical profession and B M A. meetings, the scientific sections were better attended than on any previous occasion when I have been present, and the combined meeting on the sulphonamide group of drugs was the best set discussion I have ever heard Rarely can speakers have divided up the field of discussion more carefully beforehand or have said so much of interest to both the expert and the average listener. My chief memories of Aberdeen, however, will remain of fish and comic postcards. A tour through the Chicago stockyards gives many visitors a temporary revulsion from carnivorism, but fish, being quite cold and quiet, seems made to be eaten. It is the perfect subject for still life and the Aberdeen fish market affords as great an æsthetic pleasure as any show of fruit and flowers and vegetables

Every other shop in Aberdeen sells comic postcards, and I, who have a passion for this genre, could spend many a happy hour window-shopping there Apart from a few lamentable deviations into the *Bystander Tatler* technique, they retain the primitive vigour in colour and line which links them with the work of the pavement artist and the inn-sign Most of the subjects are the same crude old topics as the Canterbury Pilgrims jested on, but they are dressed up new for our time, and the short-sighted elderly lady is seen walking down the steps of a gentlemen's lavatory in mistake for an A R P shelter.

What a difference there is between the funny postcards and the filthy picture, all the gulf between the guffaw and the snicker; I am sure it is distaste rather than compulsion which prevents the circulation of the latter. There is here at hand a wealth of material neglected by our psychologists who can theorise so much from Greek mythology, Inca legends and Barrie's "Mary Rose." I had begun to believe that drawing and scribbling in lavatories were a lost art but am now sure that this is the result of the replacement of whitewash by the glossy tile, and not of change in human trends. The symbol of the New York Fair should satisfy us on that point, and a visit a few months ago to a public lavatory on the main road through Gloucester revealed a surprising collection of wall poems, phallic symbols, cotional picture-writing and homosexual invocations *This sexual wall decoration is not a class phenomenon*, and there is a room in the hostel at Guy's which can rival anything in Gloucester or West Africa I imagine it has a special age-incidence during the period of early strong and unsatisfied sexual desire, and I should be interested to know to what extent it is observed in lavatories restricted to women My own impression is that it is a fairly conscious manifestation of the worship of Priapus and in this regard it is an interesting fact that doodling, which is a private and semiconscious occupation, is extremely free from sexual symbolism. Now that so many of our young people are being herded in camps and barracks it would be easy to obtain valuable material for a thesis by a little expenditure on paint and whitewash. An analysis of the classical barrack-room ditties might be made at the same time, noting for example the close parallels between I Love My Girl and the *Song of Solomon* At present it is easier for an educated Englishwoman to familiarise herself with the sexual stories and games of the Polynesian islanders than those of her own race

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I return home after six days to find waiting for me, in addition to much correspondence, one *B M J*, one *Lancet*, one *J A M A*, one *Proceedings of the Staff Meetings of the Mayo Clinic*, one *Proceedings of the Royal Society of Medicine*, an American group of reprints, a refugee's reprints with a request for a report, a request in relation to the Spanish war, agenda of two committee meetings, and finally a request for an autographed photograph from an

American who is "collecting medical prints and photographs of eminent physicians" If the Americans are beginning to collect photographs in addition to reprints life is going to be hard indeed I wonder whether he will "swop," as we did with cigarette cards, and offer 10 Doctor Dons for one President of the Royal College of Physicians

In the same post-bag is the demand for the annual report of my department and it seems inevitable that its work will chiefly be judged by the list of published papers at the end of that report My pride is that we are gradually building up a team, training nursing staff and technicians and accumulating useful apparatus, rather than that we have produced some hundrum papers, for I believe with Trotter that productive research is often a happy accident There is much to be said for producing a fertile soil so that the rare idea of promise can prosper, rather than farming for cash crops Seventy five per cent of the papers on any popular subject such as sulphonamide or vitamin C ought never to have been published and some of them might not have been but for this tradition of annual reports So one has to steer a way between writing too much or too little, giving up the literature altogether or reading oneself silly

The difficulty in all this is to find time for productive thinking, or, to put it another way, the easy thing is to go for many days without thinking I am not much impressed by the value of regular hours of work and play, as they can become a soul satisfying routine, and the satisfied soul rarely thinks I usually think only in three circumstances—when I am getting up in the morning, when I am on a reasonably long train journey, and when I have a cold A celluloid slate in the bathroom allows me to say with Matthew Arnold, "Quick thy tablets, memory," for it is fatal to imagine that these fruits of the fresh morning brain will survive breakfast and the hurry of beginning work and dictating letters In the railway train the stimulus to thought appears to be the complete isolation from visitors and telephone, combined with a passing scene which distracts but does not disturb Osler advised going to bed with a cold once a month, to get a little thinking done, and I am perforce laid aside by the common cold for one to three days at least twice a year When I read of our empire builders who stagger across leech infested swamps with malaria and temperatures of 104° F I feel ashamed of succumbing so easily to a simple febrile catarrh, but I am sure my absence reduces the sum total of personal and communal disability, and a convalescent day in bed with the dregs of the fever about one is a grand stimulus to the intellectual processes By thinking, of course, I mean something quite different from being at rest or lying fallow—actual hard, architectonic thinking about particular problems

> Tasks in hours of insight willed
> May be in hours of gloom fulfilled,

and I am a great believer in writing down plans and looking them up at intervals to see what progress has been made and what deviations have been allowed to take place All this may sound old fashioned and pious but professional people in general take on too much, work too hard, and think too little Architects, doctors, consultant engineers, all are as bad Those of us who have had to build know how badly architects and engineers work in consequence, and I cannot believe doctors are immune From the same lack of leisure to think governments lose their enthusiasm and purpose, and become increasingly tired, until a general election forces them out into the wilderness to frame a new programme In the professions we unfortunately have no general elections, and in clinical medicine and surgery people do not move about nearly enough, but remain treading the old familiar round and substituting local patriotism for new enthusiasms

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Another accumulation awaiting me on my return from Aberdeen was a pile of notes, for, like Stephen Leacock's old doctor, I am accustomed to read through my patients' notes when they leave hospital and wonder what was the matter with them Some times it would have been wiser to perform this judicial summing up while they were in the ward and one wishes they could be called back. I then fill in the diagnosis from Logie's Standard Classified Nomenclature of Disease This is based on the ingenious idea that every disease has an anatomical location and a pathological nature and can therefore be expressed by two numbers Happily then the tyro turns up mitral stenosis, only to find that this is not a disease but a manifestation, and must be expressed as *Rheumatic valvulitis inactive with deformity of mitral valve*, 454 196 6 It took me quite a long time to learn how to have a normal pregnancy by Logie, and it seems quite impossible under this system to suffer from either halitosis or dyschezia The supporting tissues and fascia do not appear to be recognised as anatomical structures subject to disease and I find it difficult to give my patients a number when they suffer from pleurodynia, panniculitis, periarticular arthritis or spondylitis ankylopoietica Anorexia nervosa, the title which has graced so many essays, is replaced by *conversion hysteria + manifestation* 002–x10 (613) One can also manifest *truancy* 04x or an *urge to utter words* 908, but I am still trying to discover how to commit suicide

Now it is easy to gag any system such as this and the wise man will avoid getting mixed up in the standardisation of diagnoses, diets or clinical procedures, as all are subjects which lend themselves to endless discussion Logie's system is flexible and you can do anything with it, and as more and more hospitals in the States and in this country are taking it up it seems to me essential that there should be annual meetings at which difficulties are discussed and revisions made The American Medical Association, which now publishes Logie, will be very unwise if it attempts to handle this question off its own bat The second edition of Logie changed many numbers quite arbitrarily and made it necessary to revise diagnoses Moreover the council on chemistry and pharmacy of the American Medical Association has acted with peculiar infelicity in the nomenclature of drugs Inspired by the extraordinary dogma that the name should contain no suggestion of the action of a drug, it has quite impudently changed the names given to substances by their inventors and backed its decision by a virtual ban on the market Hence the glee with which some of us have seen the defeat of Theelin and Cevitamic Acid All this is very unfortunate, as the council on chemistry and pharmacy is in general a body of extreme efficiency and courage and we badly want its fellow in this country

It is curious that plastic people like the Americans can be so ridden by dogma In 1925 they all adhered to the Shaffer ratio according to which the body burned 1—or should it be 2 ? at any rate it must be a whole number—of fatty acid molecules for every molecule of glucose Diets based on this ratio lent

current formulæ by which the diet of diabetics was composed an appearance of mathematical precision, but this was spurious, for the actual ratio was unproved, and the introduction of the more natural diets which insulin enables us to use was retarded Nowadays the van Slyke clearance test is popular, according to which, at some quite arbitrary point, the kidney begins to take the square root of its function

But to return to my point, there would be immense advantages in a uniform Anglo-Saxon nomenclature of diagnoses and remedies The Royal College of Physicians, which has published a long outworn handbook of nomenclature, and which is scanning the horizon for new tasks to occupy it when the Conjoint Examination has gone the way of all bad old things, might well take up this question of nomenclature and secure the formation of a permanent English committee. This would meet or correspond with the American committee at regular intervals and ensure agreement in a field where there is constant growth and change.

LETTERS TO THE EDITOR

THE PROBLEM OF MEDICAL LITERATURE

SIR,—I have a threefold excuse for venturing to contribute to the discussion in your columns on medical literature First, I have some practical experience of abstracting; secondly, I disagree with many of the views expressed in your leading article; and thirdly, of course, this is the silly season. You seem to argue that we must make available in this country a copy of every medical journal published anywhere in the world and you criticise the Index Medicus for not noting all papers that are printed. I would suggest that there is a better case for reducing the number of journals taken by our libraries and for persuading the abstracting journals to limit (and not extend) the scope of their activities.

I can illustrate my point by referring to the well-known case of Ruritania Ruritania produces some 50 medical journals containing annually 3000 articles. These journals serve many local Ruritanian purposes very well; they report interesting news items, they protect the material interests of the profession, they enable interchange of views to take place and they provide summaries of advances in knowledge made in other parts of the world. Unfortunately Ruritania is a poor country; its research institutes are few, small and badly equipped, and the amount of original work produced is scanty This country's language is only understood by perhaps one British scientist in a thousand. What are we to do with the Ruritanian journals? Are our libraries to buy them, bind them and fill their stacks with them when we know perfectly well that nobody will read them, and (if the truth were told) when they are hardly worth reading? Are indexing and abstracting journals published in English and intended for the English-reading world to bother with them? It might be argued that if the Ruritanian literature were summarily ignored, a certain number of original contributions of value would be lost There is, however, no real danger of this happening. The Ruritanian fully appreciates that he is in a weak position from the standpoint of world publicity and takes appropriate and effective steps to bring himself to the notice of his colleagues elsewhere If he has an exciting discovery to report (and often when he has not) he publishes it in an English, French or German journal, or in one of the international journals A high proportion of the articles appearing in the German journals originate from non-German-speaking countries. The Ruritanian will often publish the same paper with minor emendations or additions simultaneously or successively in half a dozen journals; he will lecture on the subject abroad and so be reported again; he will write reviews or open discussions at conferences on the same theme; he will contribute to monographs, textbooks and encyclopædias; in short, sooner or later, he will impress his views on even the least attentive colleague If the Ruritanians are nationally minded, they will publish a group of journals of the Acta class in English, French and German; all serious work will automatically gravitate there and thus the world will be informed of Ruritania's contribution to medical science Surely only such Acta deserve attention from libraries or abstracting services. Holland, Japan, China, the Scandinavian countries and Russia in some measure follow this practice, so why not Ruritania The Japanese also produce abstracts of all papers published in the vernacular and (I believe) present them to the principal libraries, Ruritania might do likewise

There still remains the problem of what to do with the journals published in the half-dozen principal languages We know that many of these journals publish no original matter at all, or very little and that of the slightest value In a country like Germany where medical publications are almost the monopoly of one firm, where editorial supervision has always been notoriously inadequate and where stress has always been placed on bulk rather than quality, more and more journals are becoming wholly or largely valueless as sources of significant original material. I believe myself that the situation needs drastic action A group of committees of experts should be set up to report on the journals in each specialty; if a journal failed to reach a reasonable standard of merit, the libraries should cancel their subscription to it (if it is in a foreign language) and the abstracting journals should ignore its existence No investigator of standing would then send any contributions to the condemned journal as he would naturally want his work to be put on permanent record The same weapon could be used to control new journals. If a new journal appeared with a competent editorial board and an approved policy it might receive temporary recognition and be abstracted; if it published a high proportion of rubbish, recognition should be withdrawn until it mended its ways If my proposals were adopted the financial burdens both of the libraries and the abstracting journals would be reduced.

I do however agree with you that we need a competent medical abstracting service in the English language. It is preposterous that a library should have to pay £150 a year for an abstracting service in German; first the cost is monstrously high and secondly many of our research workers cannot readily use a service in a foreign language It would not need very large funds to establish "English Medical Abstracts," if a sufficient number of men were available to carry out the organising and editorial work in an honorary capacity during the first two or three years. Section AIII of British Chemical Ab-

Physiological Abstracts, which covers the whole field of medical science with the exception of purely clinical papers, published 14,000 abstracts last year, I doubt if the papers left out would be as numerous AIII receives a subsidy of less than £2000 from the scientific bodies sponsoring it It costs only £3 5s per annum (the cost of the German equivalent which publishes the same number of abstracts is about £30) and copies are presented for nothing or for a nominal sum to the members of certain associated learned societies An annual subsidy of say £3000 for three years should put Medical Abstracts successfully on its scientific and financial feet

As a practical proposal, I suggest that the Royal College of Physicians should take the lead and set up a committee to consider the problem The committee might consist of representatives of the Royal Colleges, the Royal Societyof Medicine, certain of the learned societies, the Medical Research Council and the Bureau of Chemical and Physiological Abstracts A workman like scheme ought to emerge from their deliberations in a comparatively short time

I am, Sir, yours faithfully,

SAMSON WRIGHT

Department of Physiology Middlesex Hospital Medical School W 1 Aug 6

SIR,—With reference to the leading article in your issue of Aug 5 the problem of how to keep abreast of published information faces workers in other branches of science in Great Britain It is interesting to see how they attempt to solve it For the sciences touching agriculture there is in this country a chain of Imperial Agricultural Bureaux, which act as information centres, and publish abstract journals covering practically all scientific information on agriculture For chemistry there exists a Bureau of Chemical Abstracts which publishes the *British Chemical Abstracts* running to some 2500 large quarto pages in each year and noticing over 25,000 papers The Imperial Agricultural Bureaux are jointly financed and controlled by the governments of the British Empire and are given facilities for their work by the well known research stations with which they are closely associated The Bureau of Chemical Abstracts is closely associated with the Chemical Society and the Society of Chemical Industry, and the journals acquired by these two great societies are put first at its disposal for abstracting

If one may judge from these experiences, it should be possible, given the willing coöperation of the great medical societies, to provide a satisfactory abstracting service for medical literature at a not too prohibitive cost to subscribers In those fields in which the need for abstracting services has been met by British effort, the cost to subscribers of the abstract journals is much lower than that of their German equivalents For example the cost to a subscriber of the eleven British abstract journals covering the science of agriculture is about £17 a year compared with some £160 for the eleven German abstract journals dealing with clinical medicine, and in the medical field the British *Tropical Diseases Bulletin*, for which there is no German equivalent, and the *Bulletin of Hygiene* each costs only £1 1s a year compared with about £12 a year charged for the German *Zentralblatt für die gesamte Hygiene*

I am Sir yours faithfully,

R. L. SUTHERLAND,
Secretary Bureau of Hygiene and Tropical Diseases

Keppel Street W C 1 Aug 7

INSULIN RESISTANCE

SIR,—I regret that absence from London has delayed my reply to Professor De Wesselow and Dr Griffiths writing in your issue of July 29 The term 'insulin resistance" is, as they say, ill defined, being used to include both cases in which enormous doses of insulin appear to be without clinical effect and also cases showing only a relative resistance to insulin Until we possess more knowledge it would seem advisable to use a different term for either group of cases It was for this reason that in my original paper on insulin insensitive diabetics (*Lancet*, 1936, 1, 127) I suggested that the term insulin resistant should continue to be used for, but be confined to, those rare cases in which large doses of insulin appeared clinically ineffective, reserving the term insulin insensitive for those common cases of diabetes in which the impairment of insulin action can only be detected by special tests Unfortunately the advantage of such a distinction was not then appreciated

De Wesselow and Griffiths state that using the insulin glucose test they have found every gradation from insulin sensitive to "insulin resistant" responses It is necessary to make clear, however, that their results were not obtained by using the original insulin-glucose test but by a modification of this test which they introduced The insulin glucose test, as I described it originally, requires ten blood samples; their modification makes use of only three As the insulin glucose curve tends to be irregularly S shaped I cannot accept their opinion that "two samples taken half and one hour after administration of glucose and insulin obviously suffice to determine the general direction of the curve " It is possible to find the preliminary, the half- and the one hour samples all of approximately the same blood sugar content Under such circumstances the insulin-glucose curve might have ranged from shapes showing marked sensitivity to insulin to shapes showing moderate insulin insensitivity Using the original insulin glucose test with ten samples Kerr and I (*Clin Sci* in press) obtained data showing the existence of two clearly demarcated types of response From these same data, but taking into account only the three samples required by the De Wesselow-Griffiths test, we recalculated the results but now we could find no significant differentiation into two types We concluded that, save in extreme cases the De Wesselow-Griffiths test fails to distinguish between the two types of response, and that this failure is due to infrequent blood sampling

I am sorry Professor De Wesselow and Dr Griffiths consider I have misinterpreted Dr Griffiths in crediting him with having 'found a difference in the peripheral insulin effect in the two types of sufficient magnitude to afford support for this contention' (that the essential difference between the two types of response lies in a difference in the peripheral action of insulin) I can find no statement in my paper which taken alone or in conjunction with its context, carries this suggestion The only reference to this work of Dr Griffiths reads "Griffiths finds the peripheral effect of insulin reduced in all diabetics but more so in insensitive than in sensitive cases This is a statement of Griffiths's published results (*Clin Sci* 1939 3, 91) not an interpretation

Finally, Sir, may I draw your readers attention to an error in fig 7 of my paper which had escaped my notice The time figures should read 0, 10 30 50 min, not 0 10 20, 30 min —I am Sir, yours faithfully,

H P HAYWORTH

University College Hospital Medical School Aug 5

PHYSICAL METHODS IN RHEUMATIC DISEASE

SIR,—I have read with interest the report by Sir Leonard Hill and Mr. H J. Taylor, Ph.D., issued to the medical profession by the Empire Rheumatism Council and published on p. 351 of your last issue. As a practitioner of physical medicine may I be permitted to indicate inexactitudes it contains? To my mind it is regrettable that such a report should be circulated as authoritative.

It states that the addition of a small quantity of titanium to the tungsten arc does not make any difference to the ultraviolet output of that arc. Many of us use the titanium-alloy arc in preference to other sources of ultraviolet (which sources we have discarded) because of the increased energy output not only in the ultraviolet but in the visible and infrared region of the spectrum. The spectrograms of Mr. Judd Lewis, D.Sc, clearly demonstrate the marked difference between the titanium-alloy and tungsten arcs. In addition we have noted improved and enhanced results since we adopted this method of treatment Has Sir Leonard Hill ever treated a series of cases by means of the titanium-alloy arc or carried out a series of control tests, or is he relying entirely on his spectrograph, which obviously produces an entirely different spectrogram from that of the well-known authority, Dr. Judd Lewis?

Again the report says that "low-energy high-frequency apparatus does not heat; therefore it has no effect other than that due to suggestion, although claims are made to the contrary by salesmen of various apparatus." This "low-intensity treatment," as it is named, has been found by numerous medical observers to have most beneficial effects in vasospastic conditions, migraine, &c. Dr. Weissenberg, of Vienna, quotes many thousands of cases which have received benefit from low-intensity treatment. Dr. W. J. Turrell, of Oxford, and Dr. P. P. Dalton, of St Bartholomew's Hospital, have recorded excellent results in the *British Journal of Physical Medicine*. Personally I have "tried out" this treatment for three months and am astounded at the results. May I mention one case?

Male, aged 35, suffering from severe migraine of nine years' duration. He had on an average three incapacitating attacks per week and had tried many forms of treatment. He had been in the habit of taking three doses per day of a strong sedative, but I induced him to forgo all drugs at the commencement of his treatment. I began his treatment some ten weeks ago and he has received in all fourteen treatments of low intensity applied to both temporal regions and general ultraviolet irradiation from the titanium-alloy arc He has now ceased treatment since he has only had one threatened attack, which did not develop, in the last ten weeks. He has also gained in weight.

Another similar case has reacted as favourably. It is ridiculous to attribute such results to suggestion. It is only clinical results which in the end can lead one to appraise the value or not of any form of treatment.

I am, Sir, yours faithfully,

W. ANNANDALE TROUP.

Wimpole Street, W 1, Aug 8

THE LAY ADMINISTRATOR

SIR,—As a lay administrator I desire to enter a protest—a very mild one of course!—against the unseemly references to lay administrators in Grains and Scruples of July 29. A Woman Public-health Officer by her own statement shows that the clerk in question "whose whole idea was to keep down travelling expenses" was upheld by the local authority because, as she states, one man was sacked for protesting. The first essential for an officer of a local authority (be he professional or lay) to understand is that he or she is just a cogwheel in the machinery of government. Officers cannot do as they like but have to do as they are told. If Woman Public-health Officer finds control irksome she should seek an occupation where her independent spirit (a thing much to be admired) can have full play and she would not need to beware of the Jabberwock who, after all, is only doing the things he is ordered to do by his employers—namely, the local authority.

I am, Sir, yours faithfully,

A. A GIBB,
Hon General Secretary, Association of Public Health Chief Clerks

Aug. 2.

NURSES IN MADRAS

SIR,—On p. 235 of your issue of July 22 Miss Hartley, secretary of the Trained Nurses' Association of India, is reported as having said, at the Imperial Social Hygiene Congress, that the government of Madras had recently, without warning, made drastic changes in the conditions of service of nurses in Madras, cut down their scales of pay, stopped their special food allowances and introduced male nurses exclusively for male patients. As a result, she added, the best type of individual was no longer available for recruitment

I have followed the question with some interest Full details have been published from time to time during this year and last in the daily newspapers of Madras. It is unfortunate that Miss Hartley's statement is not fully borne out by the facts There was, in the first place, ample warning of the proposed changes by the minister of public health in a public speech. There were then many protests, with the result that the special food allowances were restored and other minor concessions made over the first government order

It is too early yet to judge the effect of the order on recruitment. It must at the moment rest with the men on the spot to say whether there has been a deterioration in the type of nurses who have applied for training after the changes were announced

Male nurses seem to be a recognised institution over here, but they were certainly unknown in Madras not long ago If I remember right, the secretary of the Trained Nurses' Association of India herself admitted in one of her communications to the press that male nurses had a place in nursing As I understood the government order, it does not altogether deny female nurses for male patients

I have deliberately avoided any expression of opinion on the new conditions of service As a public servant of the government of Madras I am precluded from discussing my employer's actions

I am, Sir, yours faithfully,

AN ANONYMOUS MADRASI

London, Aug. 7.

MORAL REARMAMENT

SIR,—The moral rearmament campaign is receiving a surfeit of publicity at the moment in the press both general and professional, and especially by way of the British Medical Association. I recently attended a county meeting of the association at which little else was discussed Your issue of Aug. 5 reports the proceedings of a reception held in Aberdeen together with a manifesto signed by many illustrious members of our profession. Surely there is no need to incorporate these ideas in propaganda for the so-called "Oxford" group, when they are precepts which should all automatically include in our work as teachings under our Hippocratic oath

I am, Sir, yours faithfully,

THINKER

Aug 7.

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By Medicus, M P

Parliament has adjourned until Oct 3 and will not be recalled before that time unless the Government consider it necessary The decision to take such a long holiday in these times was not well received in the House It is true that the recess is about a month shorter than usual, but most members feel that the times are so far out of the ordinary that a meeting much earlier would have been desirable Members of all parties, Conservative, Labour, and Liberal, said it loud and said it clear, indeed some, like the old gentleman in "Alice in Wonderland," went and shouted in his ear, but they were unable to budge Mr Chamberlain Mr Churchill shook his head "in sorrow" at the Prime Minister's attitude, and the leaders of the Labour and Liberal Oppositions expressed themselves as aghast at the decision

It has been a week of high emotional potential at Westminster, and on Friday, the last day's sitting, even Mr Chamberlain confessed that his "blood boiled" at the story of the outrages on British subjects in China This boiling said what Mr Lloyd George and Mr Churchill might otherwise have said, and so both of them, although present—in a very thin House—and prepared to speak, did not do so What the House would have liked to know was whether Mr Chamberlain would boil over into action or simmer down into appeasement

Monday's debate on foreign policy, Wednesday's debate on the length of the recess, and Friday's debate on the Far East were all of particular significance The debate on the length of the recess was in fact a debate on contrasting views of the function of Parliament, and the sentiment in favour of stressing the value of Parliament, in face of the threat to democracy by the dictatorships, and therefore calling it as early as Aug 21 or 22, was so strong that Mr. Chamberlain had to make the issue one of confidence in himself in order to get the vote for which he asked

* * *

Behind the week's emotion a great deal of routine and some emergency discussion was carried through in the council-of-state mood that has become the common denominator of parliamentary discussion in recent months On Tuesday civil defence was discussed, with practically no party division, and yet gravely and adequately considered Mr Chuter Ede, Dr Haden Guest and Mr Tom Johnston from the Labour side asked questions of, and were answered by, Sir John Anderson, Lord Privy Seal, and Mr Walter Elliot, Minister of Health, on the Conservative side All agreed that the civil defence plans would work if war came, differences were only of degree. Answering Dr Haden Guest, Mr Walter Elliot gave some helpful information for hospitals needing to spend money on defence and not knowing how to get authorisation Mr Elliot said this was stated in paragraph 1 of the No 1 memorandum on Emergency Medical Services and added that any hospital should make application to his department "forthwith" The financial terms of such arrangements with hospitals had already been agreed, every penny of expenditure in excess of £1 per bed will be carried by the Government Another medical announcement of interest is that A R P Handbook of Instruction (Stretcher Parties) will shortly be published, this is urgently required, for it is the basis of the instruction given at the A R P school in Cromwell Road Whether the book has been modified since its distillation into a page proof or not was not stated, but a clash of opinion between doctors was hinted at

With regard to evacuation of civilians from towns or especially vulnerable areas arrangements for women and children of the priority classes were complete, but for the possible "second wave" of evacuation of refugees from bombed areas some arrangements had been made, but were not yet ready for publication

* * *

There have been one or two questions this week of special medical interest A rumour had arisen that blood from donors was being taken and stored in bulk for an emergency, but the Minister of Health said that this was not being done Blood donors were being registered but would not be asked to give blood unless in time of war Blood taken from individuals would be stored separately and not mixed

The answer to a question on the patent medicine stamp duties went almost unperceived in the week of political emotions, but the reply was noteworthy, as it stated that an inquiry is to be undertaken, under the joint auspices of the Chancellor of the Exchequer and the Minister of Health, into the questions involved This inquiry will range over the whole field from taxation qua taxation to control of the sale—and perhaps manufacture—of patent medicines

Sir Reginald Dorman Smith, Minister of Agriculture, announced, in answer to a question, that the Milk Marketing Board has submitted a scheme for supply of milk at reduced prices to expectant and nursing mothers and that it will come into effect as from July 31 Later in the week the scheme was "laid on the table" which means that it can be looked at in the library of the House

* * *

The attention drawn to the pro Nazi activities of "The Link" organisation by the Home Secretary, Sir Samuel Hoare, was paralleled by a "written" answer to a question given by Mr Peake on behalf of the Home Office According to this answer various organisations including "the Nordic League" are being kept under close observation So Parliament when it reassembles may find itself discussing "What is a Nordic race?" What the mother of Parliaments would make of this discussion would certainly be interesting It would probably refer it to a commission of Lords and Commons to examine it as the claims of osteopathy were examined—and with probably the same result

FROM THE PRESS GALLERY

Civil Defence Medical Services

In the House of Commons on Aug 1 Mr Dobbie raised the question of hospital services in connexion with civil defence He urged that those in charge of the municipal hospitals had a bigger administrative experience of the kind of problem that war would bring and that the organisation of the hospitals should be more on the basis of the municipal than of the voluntary regime

Mr Simmonds said that he had received a number of strong representations from doctors who would be called upon to work in the first-aid posts and hospitals in war-time in which they expressed dismay at the lack of protection to be provided for this work. We were far behind Paris in this matter where there were 30 underground hospitals with a good deal of protection He also urged that some thing better than

splinter-proof protection should be provided for the operating-theatres of the great metropolitan hospitals.

Dr. HADEN GUEST said he wished that it were true that every doctor knew exactly what he had to do in case of emergency, but this was not so and the same applied to the hospitals. He hoped that the Government would inform them where the authority lay in the hospital sectors so that they could authorise payments for absolutely necessary expenses quickly. The success of the casualty-collecting organisation would largely depend on the preliminary training of the first-aid and stretcher parties The details of training recommended should be made quite clear either by the speedy issue of an official handbook or otherwise. Preparations should also be made to take into the country areas the second wave of evacuation with which he was sure they would have to deal.

Mr. ELLIOT, Minister of Health, replying, said that the 100,000 hospital beds on which they were counting for the first wave of air-raid casualties were ready now. They would be provided when an emergency arose by sending home the patients fit to go. The second 100,000 beds for the second wave of casualties were being placed in existing institutions by what was called "crowding." Of these additional beds 50,000 were already in the hospitals, and the second 50,000 would be there by the end of this month. By the end of September in England and Wales they hoped to have huts completed with 1760 beds; by the end of October with 7160; by the end of November with 29,500; and by the end of the year with 35,000 beds—that was, if they could keep up to schedule. As regarded nurses, the position roughly was that they had 9000 or 10,000 trained nurses enrolled and some 45,000 auxiliary nurses enrolled for training. Mr. Ede had suggested that hospital organisation rested too much in the hands of the voluntary hospitals and too little in those of the municipal hospitals, which obviously provided the larger measure of accommodation. That was so, but first of all the heads of the great teaching hospitals had a tremendous position of authority and technical pre-eminence in the profession. It was quite wrong to underestimate the prestige which they gave The administrative problem was simplified by the fact that the deans of the great teaching hospitals were not themselves in administrative units and therefore should find it easy to cooperate with the various authorities concerned. The difficulty of putting the London County Council over all the other units should not be underestimated, particularly when it came to the adjoining counties. He hoped that the experiment they had tried of drawing the executive officers from the voluntary hospitals, rather than from any of the single administrative units, would be a success It was working out that way. His representatives said that nothing could exceed the helpfulness, comradeship and desire of the local authorities, both elected representatives and technical staffs, to cooperate in this admittedly novel scheme. As regarded protection for hospitals, and particularly their operating-theatres, Memorandum No. 1 of the Emergency Medical Services stated that the authorities responsible for institutions in an area likely to be attacked should consider what protective measures were required and should then, if it was considered that the case was one for Government assistance, submit their proposals to the appropriate department, together with an estimate of the expenditure involved The Stretcher Parties Handbook of Instruction, A.R P. No 10, had been held up owing to certain professional differences, but those differences had now been composed and they would get the book out as quickly as possible It was not merely a case of actual delay but a clash of opinion with doctors, and that was always difficult to resolve.

Sir FRANCIS FREMANTLE said that the distribution of the medical services had been greatly delayed owing to the difficulty of arriving at the precise terms and conditions of service. Those had been settled within the last few weeks through an emergency committee working under the auspices of the British Medical Association and the Ministry of Health. This was a vital matter, because those who were concerned with medical work wanted to know which doctors were going to be available, where they were to come from and so on. There should be no delay now that the terms and conditions had been settled. He hoped that throughout the country the committees would now actively begin to distribute the services of the medical practitioners and consultants in their different units, so that they might get to know their stations.

Old-age Pensions

On July 27 in the House of Commons a vote of censure was moved on behalf of the Labour Opposition by Mr. ARTHUR GREENWOOD regretting

"the refusal of His Majesty's Government to provide the necessary ways and means for the improvement and extension of old-age pensions"

He said that whilst the minds of most people were weighted down by anxiety because of the unsettlement in the international situation, to a large number the risk of war was remote but day-to-day expenditure on the bare necessities of life was a constantly worrying problem The need for pensions had now been recognised by all political parties, and there was a growing recognition that there should be a good deal more generous treatment of old people. Hundreds of thousands of them were trying to eke out a decent livelihood on £1 a week. On the previous day Sir John Orr had said that old people needed 7*s* per head per week as a minimum for food alone Assuming no other resources that left 3*s*, 4*s*., or 5*s* a week to meet all the other needs of life—clothing, house-accommodation, light, repairs and fuel It was impossible to meet all these requirements out of the difference between 7*s*. and 10*s*. The result was that these people did not spend enough money on food. The Prime Minister had taken comfort in the fact that only 10 per cent of the pensioners sought public assistance. That in itself was a sad admission of the inadequacy of our pension scheme, but it did not disclose the whole truth. It ignored those who were too proud to ask for help and who starved in silence, and the considerable number—in some areas amounting to half the total of old-age pensioners—who received help from relatives which the relatives themselves often enough could not afford. The Labour Party's proposal was that the normal old-age pension should be 20*s*. a week for one person and 35*s*. for a married couple. This should be regarded as a retirement pension at 65, payable on the understanding that these people left wage-earning employment. They also proposed that where people were 60 or over, and were out of work with little prospect of getting another job, the retirement pension should also be available to them. The proposal for an inquiry was an admission that there was something that was not right, unless it was a dodge.

Mr. CHAMBERLAIN, the Prime Minister, said that when the original Pensions Act was passed in 1908 the estimated annual cost to the Exchequer was £8,750,000. In 1925, before the Contributory Pensions Act was passed, it had risen to £46,000,000 and the estimates for the current year showed a charge for these pensions of over £69,000,000. These increases were partly due to the fact that two generations ago there was a great rise in the number of births and partly to the increased expectation of life, which in itself was a result and a justification of the increased expenditure on the public-health services. What was going to be the result of this increased expectation of life, coupled with the diminution in the birth-rate which was going on at the same time? In 1931 the number of persons of 65 years and over was in proportion to the number between 15 and 65 years of age—the earning ages—as 11 to 100. In 1955 the proportion would have risen to 16 to 100, and by 1975 to 21 to 100. Surely they ought to consider the effect on the next generation of anything

that might be done today As time went on an increasing proportion of the population would be eligible for pensions and a decreasing proportion would be earning wages and therefore be able to pay for the pensions Pensions were not the only one of our social services which had been making an ever growing demand on the Exchequer Taking the last fifteen years the cost to the Exchequer of housing had grown from £9,000,000 to £18,500,000 per annum, education from £15,500,000 to £58,000,000, and unemployment insurance and assistance from £13,750,000 to £71,500,000 The total cost to the Exchequer of old age pensions, contributory pensions, housing, health insurance, unemployment insurance and assistance, education and physical training and recreation had risen in the past fifteen years from £102,800,000 to over £224,000,000, and that took no account of the block grant, in which there was a considerable element of social service During this period they had also had to find interest on the war debt, which at the highest reached £300,000,000 in a year and at the lowest £224,000,000 After giving details of the heavy cost of rearmament Mr Chamberlain said that if the Labour Party were in office they would see much more clearly the impossibility of undertaking schemes which would impose major additions to the burdens on the country What he had said in his letter to Mr Graham White was that the Government could not accept any scheme

"which would involve such additional demands on the national exchequer as would imperil that financial stability on which depend the well being of industry and employment and the maintenance of all the existing services"

The answer to the question whether anything could be done without bringing on them the danger to which he alluded in this letter must depend on what additional contributions the present contributors were prepared to make Nothing could be decided without further information on that vital point They must consult employers as well as workers and must consider what was the limit of expenditure that they might reasonably ask the Exchequer to undertake The Government had decided to undertake without delay an investigation into these matters, and hoped to arrive at a decision before the end of the summer recess If the result enabled them to do anything to ameliorate the position of the widows and old-age pensioners nobody would rejoice more heartily than he would

Standards of Nutrition

On Aug 2 there was a debate on education in the House of Commons Mr J FES SMITH, on behalf of the Labour Opposition, said that he had complained for many years that the figures published by the Board of Education regarding the physical condition of children were utterly misleading The figures in the last report were excellent, 15 per cent , normal, 74 per cent , slightly subnormal, 10 per cent , bad, 0 7 per cent or only about 1 in 150 Those figures were completely contradicted by the medical profession, and especially by the medical experts who were developing the new science of nutrition Only a fortnight ago in the House of Lords Lord Dawson of Penn had said that from 22 to 25 per cent of the children of this country were not receiving the diet appropriate to their age or necessary for their proper development and seeing that this view was supported by the figures of the British Medical Association and by experts on nutrition how could the Board of Education contend that only 1 child in 150 suffered from bad nutrition and that only 10 per cent were slightly subnormal? That was a contradiction that must be explained The explanation, he thought was that the doctors who made these examinations took as their standard of what was normal the average children in the area in which they lived If they took Sir John Orr's optimum of children living under the best possible conditions such as boys at Eton, Harrow, Winchester and Charterhouse, they got 90 per cent of school children subnormal and only a few reaching normal The medical examination of the new militiamen showed that the physical condition of the young people of the country was very satisfactory but there was some danger of being too complacent about what those figures actually showed It was important that the public should not be misled The figures quoted to the public of the examination of militiamen were these grade I, 83 per cent , grade II 9 per cent That gave 92 per cent who had passed the physical test But if they looked at the instructions given to the doctors they found exactly the same phenomenon as in the case of the medical inspection of schoolchildren the doctors were told to take the normal healthy boys of that age as grade I That was not a particularly high standard In an article in the *Times* Sir Ronald Davison had said —

> These figures do not justify any complacency over the health of the nation in all its age groups Undoubtedly a great burden of subnormal health, warped bodies and downright sickness is still incurred between the ages 21 and 50 Most of this is unnecessary and due to industrial conditions, unwise habits and poverty An ample agenda of reform lies ahead and will tax all our energies

Mr Lees-Smith urged that the first reform was to take the advice of the medical profession who had examined this problem, and to ascertain the average family income below which it was impossible to bring up children under conditions of full health and strength Taking that as their standard, they should ensure by milk or by meals that all the children in the schools from those families should receive the food necessary to give them the best possible condition of vitality The effect that this would have on the physical condition of the youth of the nation in a comparatively short time was incalculable

Sir ERNEST GRAHAM-LITTLE emphasised the need for assistance by the Board of Education in the provision of educational films in the schools He did not think it was fully realised how useful films of this kind could be There was, for example, the admirable film prepared by his friend Julian Huxley on the value of foodstuffs

Mr KENNETH LINDSAY, parliamentary secretary to the Board of Education, quoted a passage from a report by the Advisory Council on Nutrition, signed by Sir John Orr, Professor Mellanby, Mrs Eleanor Barton, and others —

> We have had under review the various methods which have been tried or are in process of trial or have been suggested for the assessment of the nutritional state We are unable to recommend any known method as reliable So far as our present knowledge goes it would seem that the clinical method given in detail in Administrative Memorandum No 124 of the Board of Education is the most promising but the trial of this method has not been sufficiently prolonged to establish its reliability

Mr Lindsay also quoted another sentence from Sir Ronald Davison's article in the *Times* —

> Meanwhile these Militia statistics are definitely encouraging They do prove that something satisfactory has been happening to our child and adolescent population since the war and still more since the beginning of the century

The aim of the Board of Education, said Mr Lindsay, was to eliminate malnutrition in the schools They did not rely on this clinical assessment He could show the House what they had done in the way of surveying the position in the areas of nearly half the education authorities in the country The board also advocated six monthly nutrition surveys If there was the slightest symptom of malnutrition nurses, doctors or teachers were encouraged to advocate the immediate provision of free milk or free meals

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In the House of Lords on Aug 4 the royal assent was given to the Public Health (Coal Mine Refuse) Act

Both Houses adjourned on Aug 4 until Oct 3

QUESTION TIME

AUG. 3–4

Nervous and Mental Disease in War-time

Mr. SORENSEN asked the Minister of Health whether, in view of the probable increase in nervous and mental breakdowns in the event of war and the need of securing adequate hospital treatment, he would reconsider the present intention of utilising certain mental hospitals for the purpose of dealing with military casualties — Mr. ELLIOT replied: The present intention is to utilise for military casualties parts of two mental hospitals only. In the war hospitals scheme full account has been taken of the probable needs of the civil population requiring treatment for nervous or mental breakdown.

Mr SORENSEN: May I take it that provision has been made for the possible increase in nervous breakdowns in war-time?—Mr ELLIOT: Yes, Sir.

Midwifery Services in Reception Areas

Sir FRANCIS FREMANTLE asked whether, in view of the difficulties of providing for the care of expectant mothers in reception areas in the event of the Government's evacuation plans being put into operation, he was satisfied that an adequate number of experienced midwives would be available.—Mr ELLIOT replied: No midwife engaged in the hospital or domiciliary practice of midwifery, whether she is a trained nurse or not, should be diverted to casualty or other non-midwifery work until the full requirements of the midwifery service in an emergency have been met. Local authorities in areas to be evacuated should make arrangements to send with expectant mothers, for work in the reception areas, a full quota of practising midwives with recent midwifery experience, and should arrange that where necessary such midwives should be obtained from all institutions and organisations in the area which, owing to the discontinuance or curtailment of their maternity work, will have midwives to spare. Similar considerations apply to midwives normally employed in the reception areas, where midwives should not be diverted to other services until the requirements of the midwifery service have been supplied.

Civil Nursing Reserve

Colonel NATHAN asked the Minister of Health the extent of the response to his appeal for an additional 100,000 hospital nurses, and the nature of the arrangements made for refresher courses for those who were trained and for training those who were not trained.—Mr ELLIOT replied: There are now some 7500 trained nurses and 2900 assistant nurses enrolled in the Civil Nursing Reserve, and approximately 45,000 women have applied for training as nursing auxiliaries In addition it is hoped that the majority of the immobile nursing members of voluntary aid detachments, some 24,000 in number, who have been released from their service obligations will enrol in the Civil Nursing Reserve, 6500 having already applied for enrolment The arrangements for training untrained auxiliaries are in the hands of the county and county borough medical officers of health with their local emergency committees, the scheme of training having been laid down by the Central Emergency Committee for the nursing profession with my approval. The training consists of lectures in first-aid and home nursing and a period of instruction in hospital amounting, if possible, to a fortnight (or ninety-six hours taken over a longer period), although a minimum of a week (or fifty hours) is permitted Refresher courses for trained nurses are being arranged by the Royal College of Nursing and in some areas by the medical officers of health and their local emergency committees.

Blood Storage for Civil Defence

Dr. HADEN GUEST asked whether the blood taken from donors to be stored for use in emergency was stored separately or mixed in bulk, whether he was satisfied as to the condition of such storage; and whether the danger of the conveyance of disease was adequately safeguarded—Mr. ELLIOT replied: Donors of blood are being grouped and registered but will not be asked to give blood unless and until an emergency arises. The blood taken from each donor will then be stored separately and not mixed The arrangements for storage are made under the supervision of pathological experts and I am advised that there is no danger of disease being transmitted through blood that has been stored under proper conditions

Dr. HADEN GUEST. Is it a fact that blood is being stored in bulk at the present time?—Mr. ELLIOT: No, Sir.

Sir FRANCIS FREMANTLE: Are sufficient arrangements being made for the different qualities of blood which it is essential to make if the scheme is to be of any value?—Mr. ELLIOT. That point is being borne in mind

Supply of Spectacles to Military Forces

In reply to several questions Sir V WARRENDER, financial secretary to the War Office, said: The normal method is that a regular soldier's eyes should be examined by a military ophthalmologist (an officer of the R.A.M.C.), and that the glasses he prescribes should be supplied by the optical appliance department of the Ministry of Pensions About four out of five cases are covered in this way. For stations where a military ophthalmologist is not available an agreement was concluded last August with the National Ophthalmic Treatment Board under which that organisation undertakes, at reasonable fixed charges, examination by an ophthalmologist and provision of spectacles by an optician. It is the only organisation in the country which provides the double service

In the case of territorials it has been decided to issue in peace, free of charge, to every member of an air defence unit who wears glasses, a pair of spectacles specially made for wear with a gas mask. For the sake of administrative simplicity it was decided for this purpose to make use of the existing agreement with the N.O.T.B for the provision of spectacles, rather than to enter into other arrangements Many representations have been received on this subject, but it is clear that the board offers, economically and efficiently, the services which are needed, and that other bodies have not the full services to offer No useful purpose would, therefore, be served by receiving a deputation.

Scientific Research Volunteers

Replying to Mr. Pickthorn Mr. ERNEST BROWN, Minister of Labour, said that the numbers of volunteers enrolled in the main categories of the central register on July 22 included 6456 persons qualified for scientific research, 4743 persons for industrial chemistry and 4617 from the universities and teaching profession The response had, in the main, been satisfactory, but some employers in certain of the more important categories had been reluctant to allow qualified members of their staff to volunteer It was thought that this might be due to a misconception of the use to which the register would be put in war-time Machinery would then exist to determine priorities of national importance between different classes of work, and before volunteers already in employment were submitted for alternative posts the observations of their employers would be carefully considered by expert committees appointed for the purpose It was, therefore, hoped that in the national interest employers would encourage their qualified staffs to enrol on the register so that it might be equal to the calls made upon it in the event of war. It was to be remembered also that the register would be available in war-time for the use of employers as well as of government departments and that in certain circumstances they might find it of great use for securing replacements of staff As the register was intended as a pool from which to draw qualified persons in war-time, volunteers should not expect to be allocated to specific posts in advance of an emergency, although it was proving possible to do this in a comparatively small number of cases

Medicine Stamp Duties

Captain ELLISTON asked the Chancellor of the Exchequer whether he could now give any further indication of his intentions with reference to the medicine stamp duties—Sir J. SIMON replied: Yes, Sir. I have been in consultation with the Minister of Health and we propose jointly to appoint a committee to examine the whole question. I am not yet in a position to announce the precise terms of reference, but the intention is that the committee's inquiry

shall cover both the control and the taxation aspects of the question

Eye Accidents to Miners

Mr DUNN asked the Secretary for Mines whether he had given consideration to the gradual rise in the rate of eye accidents to miners in this country, which shows that between 1920 and 1937 injuries to miners' eyes had increased from 3 71 in 1920 to 5 42 in 1937 per 1000 persons employed, and what recommendations he proposed to put forward —Mr GEOFFREY LLOYD replied The following table shows the eye injury rate per thousand coal miners employed for the years 1925 to 1938 No official figures are available for earlier years

NUMBER OF PERSONS WITH EYE INJURIES FROM ACCIDENTS INVOLVING ABSENCE FROM WORK FOR MORE THAN 3 DAYS AT MINES UNDER THE COAL MINES ACT FOR THE YEARS 1925 TO 1938 (EXCLUDING 1926)

Year	No of eye injuries	No of persons employed and rate per 1000	Year	No of eye injuries	No of persons employed and rate per 1000
1925	8351	1,117,828 (7 5)	1933	5874	797,291 (7 1)
1927	7004	1,037 391 (7 6)	1934	6541	707 699 (8 2)
1928	7366	951 632 (7 7)	1935	6507	779,502 (8 3)
1929	8372	969,736 (8 6)	1936	6942	777,871 (8 9)
1930	7985	913,442 (8 5)	1937	6978	803 359 (8 7)
1931	6764	877 141 (7 7)	1938	6738	802,443 (8 4)
1932	5914	827 439 (7 1)			

It will be seen that the rate for 1937 does not correspond with that given by the hon member As regards the second part of the question, continuous efforts are being made to persuade workers whose occupation renders them specially liable to such accidents to wear protective goggles, the design of which has recently been much improved

Quota for Alien Doctors

Mr ERSKINE HILL asked the Home Secretary whether the quota for alien doctors permitted to practise in this country had been reached, and whether he could make any statement as to the attitude of his department to the serious effect of over-competition in certain branches of the profession —Mr PEAKE replied The policy of the Home Office, *settled after consultation with representa* tives of the medical profession, has been that permission should be given to a restricted number of foreign doctors who have come here as refugees to practise or take appointments in this country, but it has been recognised that the number of foreign practitioners who can properly be absorbed *in the medical profession* is limited and that a careful selection must be made The Home Secretary knows of no ground for any suggestion that the admission of refugee doctors has led to over-competition

Nutritional Survey

Mr DAVID ADAMS asked the Minister of Health (1) what progress had been made in the work of nutritional survey as described in the report of the Ministry of Health for 1937-38 and when the published results might be expected, and (2) what progress had been made in obtaining statistical data with reference to the distribution of the population according to income, and whether the results would be published in a form showing clearly the differences between distressed special areas and more prosperous areas —Mr ELLIOT replied The field work of the surveys and the statistical data to which the hon member refers have been completed After any necessary analysis they will be considered by the Advisory Committee on Nutrition, of whose inquiries they form part I am not in a position to forecast the date at which or the form in which the committee's report will be published

Milk

Sir ERNEST GRAHAM LITTLE asked the Minister of Health what approximate proportion of the liquid milk at present sold in this country might be regarded as safe and unsafe, respectively so far as disease-spreading organisms were concerned, including tubercle, brucella, and other infections —Mr ELLIOT replied I am afraid that the information available does not permit of any reliable estimate being made

Sir ERNEST GRAHAM LITTLE asked which local authorities in England or Wales possessed power or took steps to ensure that milk sold within their area was pasteurised, and what action had been taken during the past three years, under the Food and Drugs Act or other legislation, to institute prosecutions in cases where tuberculous milk had been sold —Miss HORSBRUGH replied The Minister *is not aware that any local authorities have power to* enforce the pasteurisation of milk sold in their areas As regards the second part of the question, while his information is not necessarily complete, he does not know of any case of prosecution As the hon member is aware, the ordinary practice where tuberculous milk is discovered is, if possible, to trace the source of infection and to cause the infected cows to be slaughtered

Sir ERNEST GRAHAM LITTLE asked whether, in view of the medical opinion that public health was endangered by the continued sale of raw milk, he would take steps to prevent the present indiscriminate advertising of milk by the Milk Marketing Board without regard as to whether the increased quantity of milk consumed was safe or dangerous —Miss HORSBRUGH replied The Minister has no power to take steps of the kind suggested even if he thought them desirable

Sir PERCY HURD asked whether the Minister's attention had been called to the disclosure in the report of the county medical officer for Wiltshire that pasteurised milk used under the milk in schools scheme and also pasteurised milk sent wholesale to London and elsewhere had been *found to be tuberculous, and what was being done in the* matter —Mr ELLIOT replied: My attention has been called to this report by the county council I understand that investigations were made and certain pasteurising plants in the county were found to be producing milk which was inadequately pasteurised The county council informed the local authorities concerned, and the latter took the matter up In forwarding the report to me the county council recommended that the responsibility for the licensing and supervision of pasteurising plants should be transferred from the local authorities with whom it now rests to the county council This recommendation would involve an amendment of the Milk (Special Designations) Orders which would doubtless arouse con troversy but I will bear it in mind for consideration when other amendments of the orders are contemplated

Major PROCTER asked the Minister of Agriculture whether he was aware that the Milk Marketing Board had inserted in their contract a clause which prevented manufacturers of butter and cream from selling skim milk for human consumption; that as a result of this restriction *manufacturers had in some cases been forced to waste* this valuable food product, that skim milk in this was being imported in large quantities from abroad, and whether he would consider intervention in this matter — Sir REGINALD DORMAN SMITH replied The contract for the sale of milk by wholesale provides that the buyer shall not sell any separated milk except to persons previously approved by the Milk Marketing Board but that such approval shall not be unreasonably withheld As regards the second part of the question I do not know of any restrictions imposed by the Milk Marketing Board upon the sale of condensed skimmed milk or skimmed milk in its dried state, which is the form recommended for general use by the Advisory Committee on Nutrition As to the last part of the question, I have no power to intervene

Mr MACQUISTEN asked the Secretary of State for Scotland whether he was aware that for many years particularly in Scotland, prior to the intervention of the Milk Marketing Board, all classes were accustomed to drinking large quantities of fresh skim milk but that in recent years the board although charging manufacturers for supplies and permitting its sale for feeding pigs, had restricted them from selling it for human consumption with the result that large quantities of skim milk imported in cans from Holland had taken its place, and whether he would institute an inquiry into the present position — Mr COLVILLE replied The milk marketing boards in Scotland have not imposed restrictions on the sale of skim milk for human consumption

OBITUARY

CUTHBERT ROBERT KENDAL

M.R.C.S., L.S.A.

Dr C. R. Kendal, who died on July 22 at the age of 97, was the oldest surviving student of the Newcastle-on-Tyne medical school, and his death carries the mind back to the Orchard Street days when Headlam, Dennis Embleton, G. H Heath, Sir John Fife and Greenhow were honoured names among the teachers of the school As was then customary he went up to London and took the examinations from the college and hall (M R C.S. and L S A.) in 1863, so that he had been a qualified practitioner for no less than 76 years In his earliest days he was a pupil at the Gateshead dispensary, the nursery of many north-country practitioners at that time He went first into practice at Wark on the North Tyne, then a remote and delightful Northumberland village. Life for the doctor was hard, for it meant many long journeys into the hills sparsely peopled by small farmers and shepherds. Most of the journeys had to be done on horseback or afoot and going was rough in the winter. After seven years Dr. Kendal migrated to Hexham-on-Tyne, then a thriving market town often spoken of as the "Heart of all England." There he remained a well-known and highly respected practitioner, whose tall figure with the inevitable high hat was a familiar sight in the old town. But much of his practice lay in the surrounding country and rather up the valley than down Long journeys in the dog-cart were necessary, while in winter the sleigh, which he kept in his garden to the end of his days, was often in use All his life in Hexham he lived under the shadow of the ancient abbey, and as years passed on he seemed to become a link with the romance of the past. For a short time he was joined in practice by one of his daughters and then just before the war by the late Dr. Fairclough. When Fairclough died in middle life some years afterwards the old doctor who survived, still in harness, was more than twice his age.

Dr Kendal was a sound conscientious practitioner who in every emergency exhibited that gift of imperturbability which probably enabled him to enjoy his declining years and to be an example to his fellows He was interested in sport of all sorts, loved the open air with garden and flowers and was skilled as a bridge player right on into his old age His wife died in 1931, two years after their diamond wedding; he is survived by his son, Dr Hugh R Kendal, and his grandson, Dr. Hugh Yarrow Kendal, both of Westerhope, near Newcastle-on-Tyne

W. J. MAYO

Prof. J. R Learmonth writes: It is hard to realise that Dr. Will is dead. For a substantial part of his life his had been the controlling spirit in one of the greatest surgical centres in the world. Learned bodies in the United States and elsewhere delighted to honour him, and he enjoyed the admiration and respect of numberless colleagues. To few professional men comes such material success, and to fewer the combination of material success and professional esteem. Very early in his career he must have made up his mind regarding his professional ambitions; the development of the clinic which goes by his name was so logically progressive that it seemed that each stage had been planned and provided for almost from the beginning. His prescience detected the value of clinical investigation aided by the ancillary sciences, and from the earliest days of the clinic a proportion of its funds was set aside to provide for research and for postgraduate education. From this ideal he never departed; he lived to see his dream child real and so firmly established that he could withdraw from its active supervision It is quite essential that any statement of his position in the surgical hierarchy should be preceded by this emphasis on his attitude towards his work and towards his obligations as he conceived them, for with his breadth of outlook and disinterestedness he would have achieved greatness irrespective of the career he had chosen to follow.

His contributions to surgery are so classical that it is hardly necessary to enumerate them; throughout his life his chief interest was the surgery of the alimentary tract. He grew up, as it were, with gastric surgery, and his technical contributions to this subject are matched by his considered appraisal of the value of operative procedures for the relief of peptic ulceration and of carcinoma The surgery of the biliary apparatus attracted him, and from his many contributions may be selected his method of reconstructing the common bile-duct He was a pioneer in the surgery of the spleen, where he was able to benefit by the close coöperation which he had arranged between surgeon, physician and laboratory The method of repairing umbilical hernia which goes by his name has become a standard procedure He was a clear compact writer, with a gift of arrested phraseology. His major contributions are characterised by a constant endeavour to deduce general principles, and to this task he brought a vast experience, complete sincerity, and an uncommonly critical judgment As an operator he was methodical and unhurried His knowledge of anatomy and pathology made him deft in unravelling complicated problems, quick to meet emergency, and ready to modify or improvise as the need arose. When he completed an operation, one felt that it had been a piece of finished craftsmanship.

Though (like the captain of a battleship) he kept himself somewhat apart, his influence over patients was extraordinary. Many patients not under his immediate care would ask to see him, or he would discuss a clinical problem with relatives, from the least to the greatest they would accept his opinion and advice unhesitatingly, and with a completeness of trust based upon his reputation for probity and cemented by the realisation that they were in the presence of an outstanding personality His apparent aloofness was I think an inevitable consequence of his habit of taking an entirely dispassionate view of a problem One felt that it was part of a sustained effort to do what was right and fair, it was judicial rather than emotionless. Though it was never wholly discarded in private life, there are many who will remember the gracious hospitality of his home and the kindness of the lady who presided there, upon whose sympathetic understanding he had depended so much throughout their married life.

On the broader aspects of surgical policy he exerted an influence which extended beyond the United States He befriended and encouraged young men, of whom I had the honour to be one He took a leading part in the organisation of the American College of Surgeons and the American Su

Association, and was active in maintaining the high traditions of both these bodies With his brother he made munificent gifts to the University of Minnesota, which founded, and will maintain in perpetuity, the magnificent facilities for postgraduate work, both clinical and laboratory, provided by the Mayo Foundation To many good causes he gave generous financial assistance and wise advice It is perhaps too soon to make a full estimate of the part he will fill in the history of medical effort He envisaged and successfully put into operation the conception of group practice, and this effort to provide coördinated diagnosis and treatment for the sick may well come to be regarded as his supreme contribution to medicine The profession has lost a great surgeon, the sick, a tireless helper, his immediate colleagues, an inspiring leader and many of us a gentle and kind friend

Prof W McK Craig, neurological surgeon to the Mayo Clinic, writes The sad news of the death of my preceptor and friend reached me while in Aberdeen, a guest of the British Medical Association Our profession, which recognises no international boundaries, no differences of race or creed, loses a great leader, a great teacher, a great humanitarian Honours came to him and his brother because they merited recognition for the work to which they devoted their entire lives, and which achieved for them citizenship not only of Rochester and the United States but of the entire world Dr Will's greatness as a man is probably best exemplified by the devotion and loyalty which he inspired in every member of the Mayo Clinic and Mayo Foundation To us he was more than a director or chief of staff, he was a counsellor, an adviser, and a great inspiration His keen interest in our individual problems, his breadth of vision, and his great personality created an undefinable esprit de-corps which extended throughout the clinic and hospitals of Rochester He had that rare combination of professional and personal leadership which united the members of the clinic staff into one large family, and his passing means a great personal loss to those of us who were privileged to serve under him and know him

R W REID

A CORRESPONDENT writes Although it is fourteen years since Professor Reid retired from the chair of anatomy in Aberdeen University he will be sadly missed by his old students who looked forward to seeing him on their visits to Aberdeen, for no visit north seemed complete without a sight of 'Old Bobby' Considering the number of pupils who passed through his hands it was astonishing to find how intimately he recalled them and from his many kindly acts of remembrance it was easily apparent that he had followed their careers with interest He and his sister Isabella were inseparable, they had been together as he used to say, from childhood, and she was as active as he in showing hospitality to students old and new They had a very wide circle of friends and were always happy to widen that circle Miss Reid was a most delightful hostess During the war she played a very active part in running the rest-room where returning soldiers were welcomed and fed at Aberdeen station She never stinted herself but always tried to prevent her assistants from working too hard

One of Professor Reid's great achievements was the inception and cataloguing of the Anthropological Museum at Aberdeen which must always be associated with his name Although this life long hobby had its origin in anthropometry and ethnology his interests were catholic and not the least important of his collections are those of church tokens and early domestic appliances, while his interest in the pre history of Aberdeen and the Orkneys and Shetlands is evident throughout the museum

"His highly critical mind and ever youthful outlook no doubt owed much to his hobby only a couple of years ago, referring to his continued interest in the museum, he said, 'Ach well, it gives me something to *put my boots on for in the morning*' *Even at this* time no weather was too bad for him to keep an appointment with anyone at the museum, and on arriving through a blizzard which had nearly daunted us we were greeted with 'My, it was good of you to come on a day like this'—and that at 86!"

MEDICINE AND THE LAW

Lead Lying Dormant?

AT an inquest, held in Manchester on Aug 2, on a painter 55 years old, it was stated that his death had been hastened by lead poisoning that might have been lying dormant in his body for more than twenty years The man had been employed by the London Midland and Scottish railway company as a painter for thirty three years Mr Harri Heap, the Manchester city analyst, said he had examined certain organs of the dead man and found that the amount of lead in circulation was fairly large and the proportion of lead in the bones was far greater than in normal persons In the brain was 4 8 mg per kg, in the liver 6, and in the kidneys 6 The bones contained 60 mg per kg The lead which the body had not thrown out was laid down permanently in the bones, but in certain conditions of stress the lead might be released from the bones and entering the circulation set up a toxic condition Answering a juryman Mr Heap said there was no lead in the Manchester water supply, but water might be contaminated with lead from household pipes Lead could be absorbed into the body in several ways, it could, for instance, be taken when eating tinned food if the tin had a lead seal A person who ate lead had a better chance of getting rid of it because (in the scientific sense) it remained outside the circulatory system If lead were breathed into the lungs it was impossible for the body to throw it out in the usual way Far more lead poisoning was caused by breathing lead than by eating it Dr G S Smith, chief pathologist to Manchester city hospitals, stated that death was due to heart failure following bronchopneumonia and was accelerated by lead poisoning In his opinion something had occurred to mobilise the lead in the bones, the devitalised state of the body resulting from the bronchitis would be sufficient to have that effect The man had suffered recently from fading vision and faintness and these symptoms could occur as a result of lead poisoning Evidence was given by an employee of the railway company that no lead had been used in their paints for a number of years, it was stated that the man had been rubbing down wagons that had been in use for about forty years Mr Jesse Riscroft, city coroner, said the case was interesting from the scientific standpoint The jury returned a verdict of accidental death due to the man's occupation

MEDICAL NEWS

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University of C

On Aug. 5 the

M D—D N M... *M B*, *B Chir*—... Monteuuis, J A ... I R S Gordon ... M A X Cocheme... W J *D.* Fleming... G M. Lewis, T K... Fenwick, R H A... I M Jackson, W ... H. R E Wallis, O... P D Scott, D L ... H W Whittingh... Gibbens, G W H... Murray, P D S... W H C Watson

The John Luc... to Dr. J C Colb...

University of L...

Lord Dawson h... of the court in... during Professor...

At recent exan...

PH D IN THE... Harold Davis, ... Postgraduate Me... Hosp ; Li P'ei I... National Institut... Someren, London...

The following ... university :—

Mr Frederic H... Curran (mental ... (obstetrics, St ... children, St Geo... George's), Dr I ... D M Pryce (path... logical medicine, ... mology, King's Co... London School of ... King's Coll Hosp...

Chartered So... Gymnastics

The annual co... Sept 18 to 22 at... S.W.1. The ope... Barclay, who wil... and fœtal circul... Harry Platt, M S... subject will be r... fractures Furth... secretary of th... Tavistock Square...

Fellowship of M... Association

A course of ... surgery for F R C... and Friday evenin... of the West End ... Park, from Aug ... in preparation fo... be given on Mond... at the Medical S... W.1, from Sept ... for the M R C P ... in chest diseases ... Wednesdays, 5 15 ... heart diseases at ... Wednesdays, and ... clinical and path... ment of St Ma... Thursdays, 8 P M ... West End Hosp... Sept. 11 to 22), ... Maidstone (11 A M ... courses will incl... Hospital (Sept 18 ... proctology at the ... to 30), and inf...

ambridge

following degrees were conferred :—

atthews and J. D M. Jones

A J S. B. Tawse, R O. G Norman, N. E. Glover, J. N Pattinson, J. F Buchan, and (by proxy); K C Dixon, J. R Bolton, J. M Nalsh, J H Penrose, G S Graveson, F M McGown, K. S. MacLean, A. D Fisk, Maurice, G. *O* Wells, J. H. Dean, Thomas min, D. M Baker, A. P. Dick, J. M. Holford, H. K. Willis, E P. Morley, J H Burkinshaw, J. Curl, Richard Fletcher, Alfred Standeven, Caldwell, R H Elphinstone, O D Gilmore, am, J F Erskine, P W. Issac, T C N arris, J A Lorimer, P D MacLellan, John amman, P S Thorne, L. D Osler, and

as Walker studentship has been awarded ck for three years from Oct. 1.

ondon

as been appointed by the senate a member place of Prof. Frank Horton, F.R.S., Horton's term as vice-chancellor.

inations the following were successful :—

FACULTY OF MEDICINE (NON-CLINICAL)

Univ. Coll. Hosp ; M F El Seifi, British ical School ; Omar Khairat, Univ Coll n, Univ Coll. Hosp ; Margaret L Smith, for Medical Research ; and V D van School of Hygiene and Tropical Medicine.

have been recognised as teachers of the

ynes (physiology, St Bart's), Dr. Desmond iseases, St George's), Dr. C M Gwillim eorge's), Dr C P. Pinckney (diseases of ge's), Dr Kenneth Robson (medicine, St H. Maclean (bacteriology, St Mary's), Dr logy, St Mary's), Dr J H Ewen (psycho- Westminster), Dr. T. Keith Lyle (ophthal- l Hosp), Dr J C Cruickshank (bacteriology, Hygiene), and Dr C H Gray (biochemistry,

Probationary recognition.

ciety of Massage and Medical

ngress of this society will be held from the Caxton Hall, Westminster, London, ing address will be given by Dr. A. E. l speak on radiographic studies of adult lation through the heart, while Prof. l, will deliver the founders' lecture His Sest and movement in the treatment of er information may be had from the society, Tavistock House (North), , London, W.C.1.

ledicine and Post-Graduate Medical

lecture-demonstrations in neurological .S candidates will be given on Monday gs at 8 P.M. at the inpatients' department Hospital for Nervous Diseases, Regent's 28 to Sept 15 A course in physiology the F.R C S. primary examination will ys, Wednesdays and Fridays at 5.15 P M. ociety of London, 11, Chandos Street, 4 to Nov. 24 Courses in preparation examination will be given as follows : t the Brompton Hospital (Tuesdays and P.M , Aug. 29 to Sept. 20) ; in chest and the Royal Chest Hospital (Mondays, Fridays, 8 P M., Sept. 4 to 22) ; a ological class in the outpatient depart- y's Hospital, London (Tuesdays and , Sept. 5 to 21) ; in neurology at the ital for Nervous Diseases (afternoons, and in tuberculosis at Preston Hall, .r. to 5 P M , Saturday, Sept. 16). Other ade children's diseases at the Infants to 23) ; plastic surgery (Sept. 20 and 21) ; Gordon Hospital, London (Sept 25 ectious diseases at the Park Hospital (Sept. 23 and 24). The courses are open to all and associates of the fellowship, and further may be had from the secretary of the fellowship, 1, Street, London, W.1.

London Insurance Committee

The committee are returning to their office Insurance Street, and after Sept. 5 all should be sent to them there at Insurance Insurance Street, W.C.1.

Sanitary Inspectors' Association

The 52nd annual conference of this association will held at Bournemouth from Sept. 4 to 9 under the of Mr. J. C. Dawes. Further information may be had the secretary of the association, 19, Grosvenor London, S.W.1.

Cheap Milk for Mothers and Children

A scheme has now been completed by the Ministries of Health and Agriculture to enable all expectant and nursing mothers and children under five who cannot the milk they need at full retail prices to get a pint a day either free or for not more than twopence, according to their circumstances. It is hoped to achieve this by making milk available to local authorities for their maternity child-welfare centres at 1*s* 4*d*. a gallon—not much more than half the ordinary price Anyone wishing to receive milk under the scheme will have first to apply to the local authority ; they will then be told whether they are eligible and if so at what price. They will ask an approved dairyman to deliver at their home the milk to which they are entitled. It will not be necessary for applicants to be examined medically before they can be allowed a supply of milk, unless more than the normal supply is desirable on medical grounds.

The success of the scheme depends in the first instance on the response made by local authorities. Before any authority can launch the scheme in its area it must submit its proposals to the Minister of Health Local authorities should therefore take this step as soon as possible, before the milk gets lost in a maze of white papers.

Births, Marriages and Deaths

BIRTHS

DAY —On Aug 8, 1939, at the Lindo Wing, St Mary's Hospital, W.2, to Ruth, wife of Francis Montagu Day, deputy medical officer of health, metropolitan borough of Hammersmith—a son

MAGEE —On Aug 4, in London, the wife of Dr C Gaulter Magee—a daughter.

MYERS —On July 14, at Wellington, New Zealand, the wife of Mr. Geoffrey Myers, F R C S —a daughter

PASSMORE.—On Aug 5, at Coonor, S India, the wife of Dr. Reginald Passmore—a son

REES.—On Aug. 3, at Cardiff, the wife of Dr. E J. Rees—a son

TANNER —On Aug 4, at Newton Abbot, the wife of Dr. Guy Tanner—a daughter.

THOMPSON —On July 31, at Spilsby, Lincolnshire, the wife of Dr Harold Thompson—a son

WALSH —On July 30, the wife of Dr. Robert Walsh, of Osterley, Middlesex—a son

MARRIAGES

BRAINE—JAMES —On July 24, at All Saints Church, Taiping, Perak, Federated Malay States, George Ian Hector Braine, M B , to Marjorie Haughton James, M.B

COLEMAN—YOUNG —On Aug 3, Mark Coleman, M S , F R.C.S., to Margaret Winifred Young

STEVENS—COCKERTON —On Aug 1, at Seaton Parish Church, Alfred Edward Stevens, M.D , of Little Mead, Jersey, C.I., to Barbara Mary Cockerton.

SWAYNE—BLENKIN —On Aug 5, at St Albans Abbey, Denys Harald Swayne, B.M., to Katherine Margaret Blenkin, M.B.

DEATHS

GOBLE —On Aug. 3, Edwin Wallace Goble, M R C S , of Grove Lodge, Winchmore Hill, London.

ROMER.—On Aug 7, Frank Romer, M.R C.S

TAYLOR —On July 31, at The Vale, London, N W 11, Birdwood van Someren Taylor, M B Edin , C.M.S medical missionary for 50 years at Fukien, S China, aged 84

WRAGG —On Aug 4, at Southend-on-Sea, Ernest Wragg, M.B Camb

N.B —A fee of 7s 6d. is charged for the announcement of Births, Marriages, and Deaths

Appointments

BLYTH, WILLIAM, M.D. Glasg., F.R.F.P.S.G., D.P.M., medical superintendent at the Ayrcliffe Colony for Mental Defectives, near Darlington.

DAVIES, H. S., M.B. Lond., D.P.H., medical officer for Newton-le-Willows and Golborne.

FARR, JOHN, M.D. Manc., F.R.C.S.E., resident surgical officer at the Guest Hospital, Dudley.

GRAY, J. A., M.D. Edin., D.P.H., deputy medical officer of health for Barrow in Furness.

HARDMAN, JAMES, M.B. Birm., F.R.C.S., hon. neurosurgeon to the Royal Sheffield Infirmary and Hospital.

MCLENNAN, W. A., M.B. Glasg., D.P.H., medical officer of health for Dudley.

MCNEIL, A. S. B., M.B. Edin., assistant resident medical officer at the Royal National Hospital for Consumption, Ventnor.

SPRINGFORD, W. E., M.B. Lond., resident surgical officer at the Chesterfield and North Derbyshire Royal Hospital.

STOREHAM, G. R., M.B., N.Z., M.R.C.O.G., obstetric officer for Barrow in Furness and Lancashire.

VICKERS, H. R., M.B. Sheff., M.R.C.P., hon. second dermatologist to the Royal Sheffield Infirmary and Hospital.

WILLIAMS, E., M.B. Lond., resident medical officer at the Glan-Ely Hospital, near Cardiff.

London County Council's Mental Health Services—The following promotions are announced:—

CALDWELL, W. A., M.R.C.P., D.P.M., medical superintendent at West Park Hospital.

MURRAY, J. R., M.D. Lond., D.P.M., deputy medical superintendent at Banstead Hospital.

SANDS, D. E., M.R.C.P., D.P.M., first assistant medical officer at Bexley Hospital; and

WATTERSON, D. J., M.B. Camb., D.P.M., second assistant medical officer at Long Grove Hospital.

Manchester Royal Infirmary—The following appointments are announced:—

REID, R. G., M.B. Ipsol., F.F.R., D.M.R.E., radiologist.

NICHOLSON, W. A. B., M.B. Manc., F.R.C.S., resident surgical officer.

SMITH, REGINALD, F.R.C.S.E., D.L.O., first assistant surgical officer (aural).

LAWSON, H. P., F.R.C.S.I., L.D.S.R.C.S., D.L.O., second assistant surgical officer (aural).

JELLY, G. O., F.R.C.S., chief assistant to surgical unit; and

HOWAT, H. T., M.B. St. And., M.R.C.P., medical chief assistant.

Vacancies

For further information refer to the advertisement columns

Accrington Victoria Hosp.—H.S., £175.

Argyll, Argyll and Bute District Mental Hosp.—J.A.M.O., £350.

Barrow-in-Furness County Borough—Asst. M.O.H., £500.

Bath and Wessex Children's Hosp.—H.S. at rate of £120.

Bedford County Hosp.—Third H.S. at rate of £150.

Birmingham Children's Hosp.—Res. surg. O., £175. Also asst. res. M.O. and asst. pathologist, £125.

Birmingham and Midland Hosp. for Women—H.S., at rate of £100.

Birmingham University—Lecturer in physiological dept., £400.

Bradford, Municipal General Hosp.—H.P.s and H.S.s each at rate of £150.

British Postgraduate Medical School, Ducane Road, W.12—Asst. at rate of £1.0.

Bury County Borough—Deputy M.O.H., £750.

Cardiff, King Edward VII Welsh National Memorial Assn.—Area asst. tuber. officers each £500. Also two asst. res. M.O.'s for Sully Hosp., each £200.

Central London Ophthalmic Hosp., Judd Street, W.C.1—Sen. and jun. H.S.'s £200 and £150 respectively.

Chesterfield and North Derbyshire Royal Hosp.—H.S. and asst. res. O., at rate of £150.

Colchester Royal Eastern Counties Institution &c.—Med. supt. for Bridge Home, Witham, £750.

Colonial Medical Service—Two health officers, each £700.

Devon County Council—Asst. county M.O.H. and district M.O.H., £800.

Dorking County Hosp.—Res. asst. M.O. at rate of £270.

Durham County and Sunderland Eye Infirmary—H.S., £350.

Durham County Council and Seaham Urban District Council—Asst. school M.O. and M.O.H., £800.

East Ham Memorial Hosp., Shrewsbury Road, E.7—H.P. at rate of £150.

Elizabeth Garrett Anderson Hosp., Euston Road, N.W.1—Clin. assistantships in gynæcological outpatient dept.

Gloucester, Gloucestershire Royal Infirmary—H.S. to ear, nose, throat and skin dept. at rate of £1.0.

Greenwich Metropolitan Borough—Asst. M.O., £500.

Hosp. for Tropical Diseases, Gordon Street, W.C.1—Two R.P.s each at rate of £120.

Hounslow Hosp., Middlesex—Hon. physician for physiotherapeutic dept.

Huddersfield Royal Infirmary—H.S. to abnormal maternity dept. at rate of £150.

Hull Trinity Road Institution—Asst. M.O. £3.0.

Hull Royal Infirmary—Second H.S. at rate of £150.

Ilford Borough—Asst. dental surg. on £150.

Infants' Hosp., Vincent Square, Westminster, S.W.1—H.P., at rate of £100.

Kingston County Hosp., Surrey—Res. asst. M.O. (anæsthetist) at rate of £250.

Lancaster, Royal Albert Institution for the Feeble Minded—Res. jun. M.O., £125.

Leeds, Killingbeck Sanatorium—Asst. res. M.O. £250.

Leicester Royal Infirmary—Resident appointments.

Liverpool County Mental Hosp., Rainhill—Asst. M.O., locum tenens, 8 guineas a week.

Liverpool Royal Babies' Hosp., Woolton—Res. M.O., at rate of £125.

Liverpool City—Pathologist, £750.

London County Council—Asst. M.O.s Class I and II., £350 and £250 respectively.

London Hosp., E.1—Sen. res. O. £100. Also clin. asst. in X-ray dept., £35.

London University—Chair of chemistry at Royal Cancer Hosp., £1000.

Luton Borough—Pathologist and bacteriologist, £650.

Manchester, Christie Hosp. and Holt Radium Institute—Asst. M.O., £100.

Manchester, Crumpsall Hosp.—Res. asst. M.O., at rate of £200.

Manchester, Duchess of York Hosp. for Babies—Jun. res. M.O., at rate of £75.

Manchester, Park Hosp., Davyhulme—Res. obstet. officer £100.

Manchester City—Res. anæsthetists for Crumpsall and Withington Hosps., each at rate of £250.

Manchester Royal Infirmary—Two jun. asst. M.O.'s in radiological dept., each £350. Also res. M.O., £200.

Mexborough Montagu Hosp.—Res. surg. O. £100.

Miller General Hosp., Greenwich Road, S.E.10—H.P. and H.S., each at rate of £100.

New Zealand, Wellington Hosp. Board—Orthopædic registrar £500.

National Temperance Hosp., Hampstead Road, N.W.1—Cas. O., at rate of £120.

Newcastle-upon-Tyne, Royal Victoria Infirmary—Hon. asst. P.

Northumberland County Council—County M.O.H. and school M.O., £1200.

Nottingham Children's Hosp.—Res. H.P., at rate of £150.

Nottingham City Mental Hosp.—Jun. asst. M.O., £475 or £350.

Oldham Royal Infirmary—Sen. H.S., at rate of £250. H.S. to eye and ear nose and throat depts. and H.P., at rate of £175. Also two H.S.'s, each at rate of £175.

Oxford Radcliffe Infirmary—Res. surg. O. at rate of £150. Also H.P.'s and H.S.s, each at rate of £100.

Pembroke County War Memorial Hosp., Haverfordwest—Res. H.S., £200.

Plymouth, Prince of Wales's Hosps.—H.S. at rate of £150. H.P., H.S., and res. anæsthetist and H.S. to spec. depts., each at rate of £120.

Prescot, Whiston County Hosp.—Res. surg. O. and sen. res. M.O., each £100.

Preston, County Mental Hosp., Whittingham—Deputy med. supt., £800.

Prince of Wales's General Hosp., N.15—Res. jun. H.P. and H.S.'s, each at rate of £90.

Queen Charlotte's Maternity Hosp., Marylebone Road, N.W.1—Res. anæsthetist at rate of £100. Res. anæsthetist and dist. res. M.O., at rate of £90. Also asst. res. M.O. at rate of £80.

Queen's Hosp. for Children, Hackney Road, E.2—Physician for whooping-cough clinic 1 guinea per attendance.

Redhill, East Surrey Hosp., Surrey—Res. asst. M.O. at rate of £250.

Rochdale Infirmary and Dispensary—Second H.S. £150.

Royal Eye Hosp., St. George's Circus, S.E.1—Sen. H.S. and two asst. H.S.s, at rate of £150 and £100 respectively.

Royal London Ophthalmic Hosp., City Road, E.C.1—Sen. res. O., at rate of £150.

Royal Naval Medical Service—Medical officers.

Salford City—Asst. clin. tuber. officer £.0.

Salisbury General Infirmary—H.S., at rate of £125.

Samaritan Free Hosp. for Women, Marylebone Road, N.W.1—H.S., at rate of £100.

South Shields County Borough—Asst. M.O. (tuberculosis), £400.

Southampton Free Eye Hosp.—Hon. asst. ophth. surgeon.

Swansea County Borough—Asst. M.O., £500.

Tredegar, Aneurin and General Hosp.—H.S., at rate of £125.

Walsall and General Hosp.—H.S.O., £300.

Warwick, King Edward VII Memorial Sanatorium, Hertford Hill—Jun. asst. M.O., at rate of £250.

Weir Hosp., Weir Road, Balham, S.W.12—Jun. res. M.O. £150.

West London Hosp., Hammersmith, W.6—Genito-urinary surgeon.

West Riding of Yorkshire County Council—Asst. bacteriologist £650.

Western Municipal (Fever) Hosp., Neasden, N.W.10—Res. M.O., £2.0.

Woolwich and District Hosp. Assn., Shooters Hill, S.E.18—H.S. and cas. O. at rate of £100.

York County Hosp.—H.P., £150.

A MARINE HOSPITAL.—Sir Alexander Mackenzie has given £100,000 to the Lord Mayor Treloar Cripples Hospital to extend its seaside branch at Hayling Island. The money will be used to build a new hospital facing the sea, which will accommodate 120 patients. It will be specially equipped for the aftercare of cases of infantile paralysis. There will be pools for underwater gymnastics to which patients will be brought on electric trolleys, then will be lowered into the pools by special hydraulic cranes. The present small hospital will continue in use for infectious patients. The new hospital will at first take only children up to 16 years, but patients from any hospital in the British Empire will be eligible for admission.

NOTES, COMMENTS, AND ABSTRACTS

THE CONVICT AS A WORKING MAN

THE governor of Parkhurst Prison made a revolutionary suggestion at Oxford last Monday in an address to the summer school of the Howard League for Penal Reform. Discussing the habitual criminal, he proposed that every prisoner should be given a fully stamped insurance card on his release to enable him to receive unemployment benefit. If the country desired a man to live a normal life outside prison, he should not be made to live an abnormal life inside the prison walls. The governor outlined a scheme for the men sent for the first time to penal servitude. They should go to a training prison and learn to work machines for producing clothing and boots for the Government A man sent back for another sentence would go to a factory prison and be paid at trade-union rates on condition that he became a member of a trade-union The Government, being one of the largest buyers of clothing and boots, would take the whole output of the factory prison

With the economics of the plan and with the potential disturbance of private enterprise the economists will doubtless deal. If it sounds expensive to maintain the discharged convict on the dole, the cost of keeping a man in prison is not cheap The main object is the cure of antisocial habits For this purpose the modern treatment of the prisoner makes the smallest possible distinction between persons in prison and persons elsewhere The prisons have their libraries, their pictures on the walls, their cinematograph films and their wireless sets. In all the nine Borstal institutions, in all the four convict prisons and in several local prisons the system of paying wages is established It was introduced experimentally at Wakefield in 1929, was endorsed by the departmental committee on Employment of Prisoners in the 1933 report, was successfully tried with the "star class" convicts at Maidstone in 1935 and was adopted in 1937 in the Portsmouth preventive detention prison, at Dartmoor and at Parkhurst The prison commissioners have described the effect as remarkable Reports for miscellaneous offences have almost entirely disappeared The doctor's parade has dwindled almost to nothing. Even among the mentally and physically subnormal recidivists at Parkhurst there is a general air of interest and liveliness which no-one can remember before.

In the past a prisoner usually avoided the skilled trades in gaol and preferred something simpler Now he wants to work in the skilled trades in gaol because the pay is higher And the earnings begin at once on admission, the man being able to buy tobacco or other luxuries or comforts as soon as he has begun his sentence In the past he had to make a slow progress through various grades and could not smoke for the first four years of his incarceration Modern prison policy, concentrating upon rehabilitation, treats him more and more as a normal human being in the hope that he will so conduct himself after his discharge He is now a wage-earner in prison. The next step, a prison governor tells us, is a trade-union rate of wages, trade-union membership and unemployment benefit

ONE PIECE OR TWO?

WE have received the following note from "ex-sister":—

"As a nurse who trained in a London hospital 30 years ago, and with a daughter accepted for training in the same hospital, may I suggest that while so many improvements have been seen in these years, no change has been made in the uniform. Working in the Rockefeller Institute of Peking, side by side with nurses from the States, one could not but be convinced of the superiority of the drill-coat dress over the many pieced uniform of our nurses. In the event of a crisis, time must be saved and laundry work reduced to a minimum. A change of uniform for nurses could be introduced gradually with each new batch of probationers entering the hospital, sisters and staff nurses retaining the older type of dress, which would gradually disappear."

A voluntary-hospital matron, whose opinion we have asked, tells us that one of the obstructions to any modernisation of uniform has been the attitude of the nurses themselves. On one occasion, when nurses were demonstrating patterns to a hospital committee, members of the committee asked the nurses for their opinions, and all four said they preferred the existing uniform. Practical considerations demand two garments, a frock and an apron. After sanitary rounds, nurses must be able to change the top garment easily for meals. Belts, collars and cuffs could be abolished but the effect is to produce a nurse-maid kind of dress. Against any radical changes, it must be remembered that a probationer without experience depends on her uniform to inspire confidence in the patients, and there is no doubt that the existing uniform does this by adding a year or so to the eighteen-year-old. The uniform represents authority and helps the nurse around many tight corners.

A YEAR OF SANITATION

THE report of the sixth Public Health Services Congress and Exhibition[1] held last year contains a wealth of perhaps rather undigested material. No less than 472 local authorities sent 932 delegates, and 19 associations cooperated by organising meetings. Among the papers of special interest is J Wilson's on housing in the special areas of Scotland. The Scottish Special Areas housing association were arranging to build 3000 houses of poured concrete and 2000 of timber. Air-Commodore I. M. Bonham-Carter and Colonel A. J. C. Bird discuss air-raid precautions and water supply. It is comforting to learn that the ordinary filter beds of a reservoir will deal adequately with mustard gas and lewisite For the rest, the subjects range from river pollution to nursery schools and from gas-fired crematoria to cooking pans for potato crisps.

MEDICAL DIRECTORY, 1940.—This mine of information is once again in course of production and should any of our readers have failed to fill in their schedules they should do so at once. Fresh forms for those who have changed their addresses or mislaid the originals may be obtained from Messrs. J. and A Churchill, 104, Gloucester Place, London, W.1.

Dr. E. P. POULTON points out that in his paper in our issue of Aug 5 the acknowledgment on p. 309 should be to Miss E M. Hickmans, Ph.D.

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1 The Congress Organising Council, 13, Victoria Street, S W 1 Pp 539 7s 6d.

RETIREMENT OF MR. C. G ANDREWS.—Mr. C G Andrews, chief clerk of the Conjoint Board, has retired on pension He has been in the service of the board for forty-seven years, first on the Embankment and, since 1912, in Queen Square. For thirty-five years Mr. Andrews has personally informed every candidate of the result of his or her examination in surgery, both for the F.R C S and M.R C S, as well as for the L.D S It is estimated that his smiling "I am glad to tell you that you have passed" has been welcomed by some twenty-three thousand doctors, while his sympathetic "I am sorry to say that you have failed" has softened the blow for many more thousands, for Mr. Andrews was nothing if not sincere.

ADDRESSES AND ORIGINAL ARTICLES

VISCERAL NEUROSES

By JOHN A RYLE, M D Lond, F R C P.
REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE, CONSULTING PHYSICIAN TO GUY'S HOSPITAL, LONDON

III*

Cardiac Neuroses

THE relationship between emotion and cardiovascular phenomena is too well known to require emphasis Tachycardia, fainting, over consciousness of the heart, a throbbing neck, even pain in the precordial and sternal zones may all be caused by nervous influence alone

Cardiac neurosis may manifest itself by disturbances of rate, rhythm, or sensation, or by any combination of these Common enough in civilian practice it is far more common under conditions of military stress, and it is probable that many more cases of "soldier's heart" in the Great War were due to emotional causes than to the various physical and infective factors which were blamed at the time Nervous tachycardia, extra systoles, the so called "effort syndrome," simple paroxysmal tachycardia, and the cardiac component of vasovagal attacks (Gowers's syndrome) may all be reasonably included within the category of the cardiac neuroses I shall here consider the two last named only These peculiar disorders, both intermittent and paroxysmal in a manner which characterises so many of the visceral neuroses, have scarcely as yet received the recognition due to their vivid and interesting symptomatology, to the degree of ill health and anxiety which they may impose, and to the physical and psychological characteristics of those who suffer from them

SIMPLE PAROXYSMAL TACHYCARDIA

The accounts of paroxysmal tachycardia given in the textbooks are for the most part descriptive of the attack only, of the sensations to which it may give rise, the pulse rate, the heart sounds, the abrupt onset and termination of attacks, and the cardiographic findings The differentiation from paroxysmal auricular fibrillation (which in the absence of organic disease, thyrotoxicosis, or other manifest physical cause should also, perhaps, be accepted as a neurosis) and from the graver and more sustained paroxysms of flutter is duly and properly considered But even so the picture is incomplete It is as though one were to describe the asthmatic attack without describing the asthmatic patient, his antecedents, his attendant disturbances of health, and the factors in his life or environment which may be shown by long experience to be inimical Reading my case notes of patients with simple paroxysmal tachycardia I discover not only the usual points of interest attaching to individual cases but also a composite narrative and illustration which the textbooks seem to miss Once again the necessity of studying the whole man and not merely his organ or his attack finds confirmation Here are sample cases

CASE 29.—A young man had been afflicted with a stammer from the age of 3 He had had erythema nodosum in childhood At school he frequently fainted in chapel He came on account of attacks of paroxysmal palpitation and volunteered that he had felt much better from the moment when the appointment was made (How frequently we hear this comment in cases of neurosis, and how significant it is of the underlying anxiety and its present relief by a transference of decision and responsibility) Three years previously he had first been troubled by slight attacks of tachycardia but was at first able to stop them by taking a deep breath He had been excessively busy and considerably worried He was a heavy smoker, consuming up to thirty cigarettes a day His recent attacks had all started with feelings of heat and sweating, he then had an urgent call to stool and passed a bulky formed motion, then the tachycardia followed, and he quite often vomited The tachycardia would generally last an hour or so, but on one occasion it had persisted for twenty-four hours Although in a recent attack a medical man had counted the pulse-rate at 120 only, an observation which might have thrown doubt on the diagnosis, the patient himself, who was experienced in pulse-taking, described it in other attacks as "as much as he could count"

Here a mere description of the cardiac attack would have omitted much essential background and conveyed no indication of the much more general "explosion" manifest in the sweating and gastro intestinal symptoms, or of aetiological factors and the modifications of habit likely to lessen the frequency of the attacks

The three cases which follow illustrate the association of paroxysmal tachycardia with other nervous and visceral disturbance

CASE 30.—A retired merchant, aged 69, had had bouts of typical paroxysmal tachycardia since school *days, coming at first at long intervals but in recent* years more frequently Lately he had developed spasmodic asthma He had fears of driving in taxi cabs, and yet if he started an attack out of doors he would at once jump into one and drive home He dated his chief deterioration in health from an occasion when a doctor who saw him during an attack remarked that he was dying The attacks would last from two minutes to five hours One had lasted seventeen hours Onset and termination were abrupt His blood-pressure readings were *185/100* There were *no other signs of disease*

CASE 31.—A man, aged 62, had spent a healthy life in youth sheep farming until the age of 21 and thereafter was in business in the city until the age of 50 One night in June, 1918, after physical exertion followed by a big dinner and much tobacco he had his first attack of paroxysmal tachycardia Thereafter, between 1918 and 1931, he had had *seventy-six attacks* The pulse rate in the attacks was about 160. They would start and usually end abruptly He continued to play golf and to lead an active life The attacks were preceded by a feeling "like a tennis ball" below his left ribs, and he associated them with his large bowel There were no signs of organic disease

CASE 32.—A medical student, aged 21, who had an extremely bad stammer, complained of attacks of paroxysmal tachycardia with pulse rates up to 180 or 190 a minute, starting and ending abruptly He remembered attacks in childhood but was then free of them for some years They reappeared occasionally when he was startled At first occurring approximately once a month they had lately become more frequent They could be arrested by lying down He recognised that attacks could be brought on by violent exercise but continued to play rugby football He had also recently developed asthma, which was commonly induced by *sneezing, coughing*, or even by a deep breath Usually the asthmatic attacks lasted a few minutes, but he had had one or two which lasted all night They were cut short by inhalations of amyl nitrite One maternal cousin was an asthmatic An example of cardiac,

* The third Croonian lecture, delivered at the Royal College of Physicians on May 25 1929 Lects I and II have appeared in previous issues of THE LANCET

respiratory, and speech "stammering" in the same individual.

In a series of 21 cases of simple paroxysmal tachycardia the ages varied from 21 to 76, with an average of 53 years. In the older cases the history of attacks often went back many years, and there was nothing to support the view that the degenerative changes of the later decades were contributory In 3 cases there was a family history of asthma, and in 1 instance the patient's daughter also had paroxysmal tachycardia. In 9 cases the following associated neuroses were recorded: asthma and stammering; asthma, stammering, and colonic dysfunction; migraine and heartburn; aerophagy or "flatulence" (3 instances) and (in 1 of them) vertigo; colonic dysfunction; dysmenorrhœa. Anginal pain accompanied the attacks in 2 cases but did not occur at other times; 1 patient had angina of effort but had no pain in the attacks Anxiety and worry in a few cases, and in 1 case startling events, were mentioned as conducive to attacks When digestive disturbances were associated with them in the patient's mind, spastic colon and aerophagy seemed best to fit the symptoms described.

There are no good grounds for regarding simple paroxysmal tachycardia as an expression of cardiac disease or intoxication. The differential diagnosis is seldom difficult. Its intermittency, its persistence through long years without physical deterioration, its temperamental and other associations, and the absence of all organic signs bring it within the category of the neuroses. Although it may be associated with asthma, and although a severe tachycardia accompanies anaphylactic shock and serum-sickness, we are scarcely entitled to claim paroxysmal tachycardia as an allergic phenomenon It may express the nervous constitutional endowment with which the allergic tendency is also commonly associated, but further than this we cannot reasonably go In this respect it takes its place with the spastic colon, globus, and proctalgia When, as may happen, organic disease or hyperpiesia is superadded, or sometimes when the attacks are very prolonged, then heart-failure may ultimately follow and even death. Asthma and angioneurotic œdema, which do not cause irreversible structural change in the bronchioles or the laryngeal mucosa, are also very occasionally fatal through secondary effects

VASOVAGAL ATTACKS (GOWERS'S SYNDROME)

I have taken a particular interest in these strange and sometimes alarming seizures since first reading the description of them by Gowers in his "Borderland of Epilepsy" (Gowers 1907) some fifteen years ago. Although there are minor differences in description they are not, I think, to be separated from the angina pectoris vasomotoria of Nothnagel (1867). It is a matter for some surprise that they still so often escape recognition; that the cardiologists have not paid more attention to them; and that the psychiatrists are often content to dispose of them as "anxiety attacks"—a description which is only partly true and offers no hint of the features which distinguish them from other anxiety reactions. In general practice they are often loosely labelled "heart attacks"; this again is to be deprecated, for it tends to maintain the anxiety to which their perpetuation is in large part due To me they appear as at least as worthy of separate consideration as ordinary faints, petit mal, or vertigo. They have a characteristic symptomatology; there are objective manifestations of a striking kind at the time of the seizure; they cause intense mental misery and physical prostration; during an attack the appearance of the patient may be sufficiently alarming for relations and even medical men to suppose that the patient is dying; and at times the differentiation from the anginal seizure of coronary artery disease is by no means easy.

Lewis (1932) prefers to employ the adjective "vasovagal" in connexion with ordinary faints or syncope, objecting that the components of Gowers's syndrome have not been sufficiently studied, and that the case for vagal and vasomotor effects is not so clearly established as it is with the faint. He emphasises the subjective at the expense of the objective features in Gowers's syndrome, but the latter are at least as striking as those observed in the faint and of longer duration Gowers and Nothnagel described the facial pallor, the white and cold extremities, the subungual cyanosis, the contracted radial artery, and I have many confirmatory observations of my own.

A leading although not a visceral symptom is the sense of dying, or angor animi, a peculiarly terrifying and, as Allbutt (1915) insisted, an "organic" sensation, which is recorded occasionally also in the angina of coronary disease and in severe vertiginous seizures. Trained observers have noted it in themselves as the most disturbing symptom of too large a dose or too sudden an administration of adrenaline. It has also been noted by C P. Symonds (private communication) in cases of tumour and gumma of the medulla oblongata. Accompanying this strange sensory experience there is commonly a sense of thoracic constriction and discomfort or actual and sometimes severe pain in the sternal or precordial region with radiation into the left arm and up the left side of the neck The pain and constriction may accompany effort but are generally independent of it. Feelings of indescribable malaise, of helpless immobility, and a leaden feeling in the arms, more rarely with tingling or tetany, are also described. A sense of unreality at the onset of an attack is sometimes mentioned Coldness, even with shivering, and prostration follow the attack; the prostration may persist for many hours Very rarely there is a loss of consciousness; when this happens it is apt to last much longer than in a simple faint. The objective signs include pallor and coldness of the surface and extremities, extreme slowing or, conversely, acceleration of the pulse-rate, shallow and rapid breathing (which is probably responsible for the tetany when this occurs), and remarkable fluctuations in the blood-pressure. I have counted a pulse-rate of 44 in a woman whose husband, a doctor, had counted it as low as 30 during the height of other attacks, and in one attack, in which consciousness was lost, he made it as low as 19 a minute. In this attack she "looked like marble" Her earlier attacks were accompanied by sternal pain and were taken for true effort angina.

There are notable reminders of certain of the phenomena which accompany other paroxysmal disorders. Thus the same pallor and vasomotor changes are seen in fainting and vertigo, and again these are scarcely to be distinguished in their full development from the same manifestations in surgical or anaphylactic shock or an extremity of fear. The same prostration, often enduring for hours, follows a bad vertiginous or migrainous attack. The same pain and the same sense of constriction and immobility accompany the angina of effort. The occasional loss of consciousness reminds us of fainting and epilepsy

Vasovagal attacks almost invariably occur in persons who are simultaneously afflicted by some slight impairment of general physical fitness and by

chronic or recurring anxiety—a further example of the combined influence of several factors which would seem to underlie so many of the neuroses. Of physical factors the menopause or a low-grade infection or an anæmia are especially to be remembered. Occasionally a sudden visceral disturbance may induce an attack. Colonic irrigation repeatedly caused attacks in one of my patients; a severe cut out of sea air in another.

On the basis of the foregoing description and the specimen case-reports which follow, some violent vasomotor disturbance with accompanying vagal effects, manifested especially in the occasional bradycardia, seem to afford the best explanation of the attacks. The visceral character and distribution of the cardiac pain point to coronary spasm. The vagal phenomena—slow pulse rate and the curious powerlessness and immobility which affect the limbs, taken in connexion with the occasional appearance of angor animi in patients with organic lesions of the medulla oblongata all suggest the inclusion of the medullary level of the nervous storm. Not dissimilarly the migraine episode may mimic or suggest organic disease at a lower level by causing transitory hemiplegic symptoms. Associations both with migraine and epilepsy have been noted in patients liable to vasovagal seizures.

The close resemblance of the symptoms in some cases to those of anaphylactic shock make it tempting to bring Gowers's syndrome within the allergic category. Pallor, coldness, substernal oppression, and striking pulse rate and blood pressure fluctuations are common to the two conditions. It is thus of more than passing interest that one of my patients developed his attacks after a second course of tetanus antitoxin, and that another had had a preceding anaphylactic upset from bee stings. Migraine was an associated neurosis in eleven cases, and mucous colic, angioneurotic œdema, and spasmodic *rhinorrhœa* each in one case. These observations notwithstanding I prefer for the present to regard the syndrome as a non-specific manifestation of combined physical and emotional origin in patients of a particular constitutional type.

As with ordinary fainting, so with vasovagal attacks, the anxiety and uncertainty engendered by the attacks themselves may be reasonably regarded as a perpetuating or conditioning factor. In some patients the attacks recur at intervals over a period of many years. Sensible psychotherapy and attention to general health bring long or lasting relief to others.

In my series of 93 cases there were 31 men and 62 *women*, 77 per cent. were between the ages of thirty and sixty. Other visceral disturbances, referable especially to the stomach, and *wide spread vasomotor* symptoms may accompany Gowers's syndrome, and cardiac symptoms are not present in all cases. They were recorded in 42 (just under 50 per cent.) of the present series and included precordial pain radiating into the left arm and up into the left side of the *neck, a sense of constriction* in the chest, and feelings of pressure and palpitation. Occasionally there was an associated sense of dyspnœa. Probably most cases formerly called pseudo-angina belong to this group. In 51 cases of the whole series, or rather more than half, angor animi or the sense of dying, a symptom which I have discussed formerly at some length (Ryle 1928, 1936), was the leading symptom. How can so peculiar a symptom *be* accounted *for or* defined?

According to the James-Lange hypothesis (James 1890) the emotion of fear represents the summation of all the sensory effects of the reflex bodily phenomena induced by a terrifying event. It might be argued on this hypothesis that the bodily processes due to the graver known extremity of fear, namely that engendered by an immediate threat of death from some external cause, even when they happen to be otherwise induced, can still evoke the same sensations with the same connexion of death's imminence. The blanched and powerless fear of the subacute criminal or the sensible and the 'frozen' state of the rabbit controlled by a snake or a stoat (a state with which one of my patients compared her own condition) may well include the angor animi of the patient who suffers from Gowers's syndrome. In all these states it might reasonably be argued that the physical sensations cause the emotion and not *vice versa*. When, therefore Clifford Allbutt refers to the feeling of impending death as "an organic sensation" he may be employing, in less explicit form the James-Lange interpretation. Of the reality of the sensation of impending dissolution in a vasovagal attack it is impossible to feel any doubt. Dread and panic may accompany it, but again it is described not as a "fear" but as an actual 'feeling' of dying. Two distinguished colleagues one a physiologist and one a physician, have told me that they had experienced this sensation after an injection of adrenaline.

Is it extravagant to argue that lesser anxieties in a debilitated and nervous subject may sometimes produce the total physical effects of extreme terror? May not new knowledge of the hypothalamus viewed as a "central exchange" or "relaying centre" for the emotional impulse, help to remove existing physiological objections to the views of James and Lange?

CASE 33.—A small highly-strung woman a martyr to migraine," aged 37, was profoundly shocked by the sudden death of her husband during a game of tennis. She straightway felt extremely cold and soon afterwards became conscious of her heart and of dyspnœa on effort and later of precordial pain and a sense of constriction across the sternum, which would develop either with or independently of effort and often wakened her at night. It became impossible for her to push her child's perambulator. There was no sign of organic disease. Blood pressure 110/80. Later she became subject to attacks in which she felt dreadful, not like an ordinary faint, her heart felt enormous, and there was tightness in the chest." One of these attacks immediately followed a bad migrainous episode, in which she had fasted for four days, and terminated with fainting.

CASE 34.—A nervous and introspective young man, with a nervous inheritance, underwent an exacerbation of his natural anxieties in consequence (*a*) of a series of deaths among his immediate colleagues, (*b*) of personal fears of disease; and (*c*) of apprehension in connexion with an imminent return to the east while still unfit, his wife and baby remaining in England. The symptoms which he described were at first regarded as cardiac; later his appendix was removed, and then he underwent treatment with emetine because amœbic cysts were found in his stools, finally duodenal ulcer was suspected and he was given treatment which seemed to make him worse. His actual complaint was of precordial and left axillary pain with radiation down the inner side of the left arm, together with tightness in the chest, difficulty in breathing, and panic. There was no clear reference to food or effort. He was an air-swallower. There were no signs of organic disease.

CASE 35.—A woman, aged 50 overworked, saddled with many anxieties, and with a hypochromic anæmia, described recurrent attacks in which her heart

pounded and she was dyspnœic and had an overpowering sense that she was dying. The acute phase of such attacks would last half an hour, but they would leave her unsettled and anxious for many hours. At the beginning of an attack she experienced a feeling of unreality, and surrounding objects seemed unfamiliar and remote. In one attack with severe angor animi she saw her reflection in a glass; she was very pale with dilated pupils. Shallow breathing was noted and was followed by tetany. Apart from a hæmoglobin figure of 75 per cent. there was no sign of physical disease.

CASE 36.—A medical man, aged 43, liable to migraine from boyhood and with a history of duodenal ulcer at the age of 36, developed attacks characterised by a sense of unreality and of falling through the bed. Simultaneously he had strange feelings in the epigastrium and precordium and a feeling of impending dissolution. He was still liable to hunger discomforts, and the vasovagal symptoms were apt to develop in concert with these. Virginian cigarettes disagreed with him. There were no signs of organic disease.

CASE 37.—A nervous man, aged 46, with a cancerphobia and a liability to flatulent discomforts, was extensively stung by bees in June, 1936. An attack followed in which he had a sense of impending death and a weak slow pulse. During the next six months he had a recurrence of similar attacks. His pulse-rate would be as low as 50 at these times. Other symptoms described were dyspnœa, coldness and trembling. There was a bad psychological family history on his mother's side.

I have elsewhere described in some detail other cases belonging to this group (Ryle 1936). With minor variations there is a striking uniformity in the volunteered or elicited accounts. The dread even of naming the leading symptom may inhibit free description in the early stages of an interview. In two or three cases I have recorded severe pain indistinguishable from that of organic angina, from which the distinction was ultimately made by careful observation of the case over long periods of time, or by a change in the character of the symptoms or the circumstances of the attacks

Multiple Visceral Neuroses

From what has gone before it is clear that there is often an association of several paroxysmal neuroses in one patient, and that these are not necessarily confined to the viscera. Hay-fever, migraine, or angioneurotic œdema may occur in conjunction with the spastic colon or with proctalgia, or asthma with paroxysmal tachycardia. The association of asthma and urticaria with neuroses of the abdominal viscera was noted by Allbutt (1884). Whether we regard the disturbances as manifestations of a humoral or emotional pathology, this is what would be expected, and it is, perhaps, worthy rather of remark that such associations are not more constant. The selective action of particular types of disorder or disease on particular organs or tissues is a chapter of pathology or psychopathology which still remains to be written, and the *locus minoris resistentiæ*, familiar enough to patients and physicians, but rarely finds a ready explanation in anatomy or physiology With one patient or family the stomach, with another the heart, the bowel, or the bladder, with a third the lungs or the joints are recognised repeatedly as "weak-spots" in the constitutional defence.

It is to be noted, however, that multiple visceral neuroses rarely occur together in point of time They alternate in a history or appear at different periods in a patient's life. In this respect we encounter an essential difference between so-called allergy and the more pronounced and specific anaphylactic response. In anaphylactic shock or serum-sickness in man we observe simultaneously or concentrated within a period of hours or days the symptoms of shock, with a profound fall in the blood-pressure; tachycardia; the sense of impending death; angioneurotic œdema; urticaria; asthma, and gastro-intestinal disturbances (usually with diarrhœa) and polyarthritis. As I have shown elsewhere (Ryle 1936) anaphylaxis in its most alarming form may occur in man not only immediately after the administration of serum but occasionally also a week later, replacing the more usual serum-sickness The simple urticarial response is more usual, but in the less severe reactions intermediate between minor serum-sickness and grave anaphylaxis multiple phenomena are common If the spontaneous disease (or allergy) is to be regarded as a true counterpart of the experimental or induced disease (or anaphylaxis), should we not expect occasionally to encounter examples of acute or recurring illness of a spontaneous kind with multiple and synchronous manifestations? Although they are rare, when we consider the great frequency of the isolated or separate manifestations, such cases do occur. A more intimate study of these cases, with a view to discovering the relative contributions of emotion and food or other allergy, would be particularly valuable.

Therapeutics

Of the physician it is naturally expected that he will give some account of the treatment of those diseases to which his attention has been closely drawn In my early years a wise friend advised me never to write on treatment. Apart from some passing commentaries on therapeutic principle I have rarely gone counter to his advice. More follies and fallacies are perpetrated in the name of therapeutics than in any other branch of medicine or medical writing They have been particularly numerous in connexion with the allergic disorders and the visceral neuroses The genuine epoch-making advances today are derived from scientific experiment and the contributions of physiology, chemistry, pharmacology, and immunology. This does not, however, imply that the practising physician need become a nihilist or a disbeliever or deficient in useful method. The treatment of all diseases and especially of those of long persistence and without specific cause and remedy, is the treatment of the patient. It is an individual and personal affair, consisting largely of understanding and management both in a physical and a psychological regard. As such it is beyond adequate description. The best indications for appropriate treatment will be found in the best and most detailed account of the disease and its victims Of no group of maladies is this more true than the functional disorders of the viscera, which, as has been shown, may be viewed as the ultimate expression of personality and inherited constitution in conflict with natural adversity I could wish that my own descriptions had been better, but such as they are they should give the clue to many details of rational treatment.

The first essential is, as always, a diagnosis as confidently made and stated as possible Indecision in the presence of a visceral neurosis, a questioning of "appendicitis," or of "heart-disease" or a "tired heart-muscle," of "inflammation" or "ulceration" in the bowel or bladder, can only perpetuate the anxiety which is the basic disease, or a part of it and will tend to counteract such benefits as may accrue from other reassurance or from diet and regimen however suitably chosen.

The second essential is a simple and reassuring explanation of the nature and genesis of the visceral symptoms themselves and of their innocence so far as life and ultimate prospects are concerned. The third essential is an exploration, with the patient and sometimes with a near relation, of his habits and mode of living, his economic and domestic circumstances, his fears and doubts, and the provision of a definite, but not too elaborate, scheme of readjustment where readjustment is possible. Holidays, hobbies, relaxations, exercise have their part to play. Sensible dietary reforms, without suggesting that food is ever the *causa causans* of the trouble, are of value in heartburn and the colonic neuroses. Avoidance of condiments, strong tea, alcohol, and cooked fats in the former, and of what our American colleagues call "roughage" in the latter, may be reasonably enjoined. Under- or over-nutrition may call for appropriate advice. The purgative habit should be discountenanced. A hot bath may bring ease to an aching colon at the day's end. For paroxysms of tachycardia there are the various although rarely effective "tricks," such as abrupt change of posture, a hot or cold drink, or pressure on the carotids. Drugs should play only a subsidiary part and should be few. Sodium bicarbonate and aluminum hydroxide are useful for heartburn, belladonna, with some patients, for the spastic colon. Bromides are of assistance to some anxious folk but not to all. Barbiturates in judicious dosage may be used for the restoration of sleep lost through fatigue or anxiety or over-activity of mind.

If it be judged necessary to employ accessory methods of investigation, such as X rays, a chemical analysis, or the electrocardiographic tracing, it should be made clear to the patient that this is merely a contribution to thoroughness (which the anxious mind always appreciates) and for fuller definition and reassurance. Such methods can genuinely assist diagnosis and treatment not only by eliminating organic possibilities but also by demonstrating the type of a dysfunction.

Prognosis

Of the neuroses described it may be said, as with asthma, that they scarcely ever kill. Very occasionally paroxysmal tachycardia may cause a fatal failure. Vasovagal attacks appear repeatedly to threaten life, but I have never heard of a death. For the rest it may be said that these organ neuroses again resemble asthma in the variety and irregularity of their behaviour. In some patients they occur once or twice only in a lifetime, in others they recur intermittently through many years. In some they are a cause of continuing distress of mind and body, in others an occasional nuisance arriving only in response to some extra load of care or irritation or a passing indiscretion or without discoverable cause. The graver cases are in the minority, but they can be very crippling and may even lead to periods of bed-ridden invalidism in the less robust. Particularly is this true of mucous colic, paroxysmal tachycardia, and Gowers's syndrome. The prognosis, in the long view, depends very largely on the personal qualities and reserve powers of the individual, on the attitude of relations, and not a little too on the patient's fortune or otherwise in escaping the diagnosis of organic disease and inappropriate physical treatments. The psychiatric ability of the medical adviser can play a really important part sometimes in the actual relief of distress, sometimes in the encouragement given to lead a normal life in spite of it.

Ætiology Reviewed

In reconsidering ætiology should we not now remind ourselves that many people, who otherwise show little evidence of allergy or neurosis, experience on rare occasions in a lifetime one or other of the neuroses under review or some one of their familiar congeners? Are not the best of us at one time or another a little bit "allergic" or neurotic? In taking histories we often obtain an account of a solitary attack of urticaria or of a brief phase of asthma. A mildly migrainous subject myself, but otherwise blessed with excellent health, I have three times in my life at a time of great pressure of work and private anxiety experienced nocturnal proctalgia. An otherwise healthy member of my family has had a solitary attack of urticaria, anaphylaxis after a bee sting, and colon spasm when cold and tired, and once or twice after a bad coryza has had bronchial spasm in mild degree. None of these have ever "made her a patient" in the ordinary sense, and all were so transient that they brought no interruption to a very active life. The diathesis for any morbid state must be an affair of degree as well as kind. About the mean which we call "normal" there extends in either direction an increasing or diminishing degree of liability to certain biological reactions to everyday fatigue and to certain endogenous or exogenous irritants, whether physical or psychological.

Emotion and certain physical factors, such as heat and cold, can produce manifestations commonly ascribed to allergy as well as certain less determinate visceral disorders. To say that neurosis and allergy can be separately recognised and classified is, perhaps, to create an artificial distinction which may hamper rather than assist our diagnosis, our treatment, and our ideas. I am not yet satisfied that this separation in the case of man is biologically sound.

Conclusion

A study of the visceral neuroses is a study of men and women, of personalities and temperaments, of heredity, habits, and environments, and of peculiar biological responses to common but often inconspicuous stimuli. These responses must constantly be thought of in terms of physiology, and for vague concepts and terminologies, such as "nerves" and "nervous heart," we must come to substitute those concepts which Cannon (1936) and Pavlov (1927) have made possible for us by patient experiment and clear exposition. The elementary emotions and reactions of men and cats and dogs are very similar. Amid the fret and swift vicissitudes of the present day and with increasing restraint upon the external expression of the emotions it is not surprising that their internal expression, at times in most of us and often in some, should become erratic and exaggerated.

In explanation of the visceral neuroses and of their tendency to be perpetuated over long periods of time we may invoke an inborn nervous instability, the conditioned reflex or habit, endocrine imbalance, and allergic sensitisation, operating severally or in conjunction. We may come to believe that the ultimate stimulus which promotes the spasm of plain muscle or the cardiac acceleration is specific and chemical. With the aid of physiological and pharmacological experiment we may discover better measures of counteraction and symptom-relief. But in the end our understanding and some of our best protective contributions are likely to derive largely from a clearer knowledge of the whole man, and from improved diagnostic achievement, which, if it

does nothing else, will save countless patients from the suspicion of organic disease and the numerous improper treatments which result therefrom Without this clearer knowledge, moreover, psychotherapy must be denied the full scope and opportunity which its progress now requires.

As Clifford Allbutt (1884) so rightly insisted, the patients whose troubles, following his method, I have set myself to consider are very worthy of help. If they are sensitive and "barometric" they are also commonly intelligent, conscientious, industrious, useful, and active in times of health, and their ailments are very far from imaginary. Indeed, they may be as real and crippling as some of the structural diseases which affect the very organs which torment them.

I believe we would do well for the present not to become too subservient to the idea of specific æthologies, and that in asthma, urticaria, and hay-fever we have, as practitioners, only a little more justification for an exclusive concentration upon the allergic hypothesis than we have in the case of heartburn, proctalgia, paroxysmal tachycardia, and the vasovagal attacks of Gowers. Non-specific therapy may certainly succeed in practice where "specific" measures fail Would it not be wiser, while research continues, just to accept that there are certain human constitutions hypersensitive in their reactions to minor physical stimuli, such as dust in the case of the asthmatic, and cellulose residue or east winds in the case of sufferers from colonic spasm; to minor chemical stimuli, as in the case of the pollen- and horse-sensitive asthmatic and the egg-sensitive individual with his digestive crises; and to those numerous psychical stimuli which are known to be effective in determining so many of the visceral, bronchial, or cutaneous neuroses? Must we not also accept that in most of the patients afflicted with these neuroses any or all of these three types of stimulus may operate with identical effect at one time or another, and that the real rarities are those cases in which there is a single specific stimulus with a single effect? Taking this view, as clinical experience compels me to do, I feel that there is good justification for retaining "visceral neurosis" as a generic descriptive term.

For a more precise appreciation of the morbid behaviour of the viscera we shall look eventually to the contributions of physiology, expecting new light from its further investigations of the hypothalamus and the vegetative nervous system. Biochemistry and psychology will also lend their aid Investigation by the methods of these sciences, however, will never preclude or prove competent without the more comprehensive clinical study of the total natural history of these interesting disorders. Such study must continue to fall to the physician, as human biologist, in his intimate associations with man in health and disease and in that much debated borderland which lies between.

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TRANSPLANTATION OF THE URETERS INTO THE RECTUM

BY MIROTVORTZEFF'S METHOD

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THE operation of transplantation of the ureters into the rectum, first done in Russia by Tikhoff's method in 1905 and then by the method introduced by Prof. S. R. Mirotvortzeff in 1909, soon became established in the treatment of various kinds of urinary incontinence, replacing Maydl's operation and other means of forming an artificial bladder. Maydl's operation proved to be technically more complex than separate transplantation of the ureters and it gave worse results with a higher fatality-rate The ingenious methods of making an artificial bladder, either inside the abdominal cavity or from the skin of the abdominal wall, did not solve the main problem of preventing ascending infection. They led only to stagnation of the urine and precipitation of concretions, while they were quite unsuccessful in eliminating the principal cause of suffering—incontinence—because the new bladder has no sphincter.

MIROTVORTZEFF'S OPERATION

The surgical clinic of the Saratoff Medical Institute has records of 23 cases treated by Mirotvortzeff's method, and I have collected another 48 from other sources, making a total of 71 cases. The operation is performed as follows:

The patient is deeply anæsthetised and placed in the Trendelenburg position. The abdominal cavity is laid open from umbilicus to pubis and the intestines are retracted to the upper part of the abdomen. In small children it is difficult to keep the coils of intestine inside the abdominal cavity and they must be allowed to come out, an assistant keeping them covered with gauze soaked in saline. This increases the difficulty of operating on young patients but it cannot usually be avoided. The cord-like ureters can now be either seen or felt. In all cases of ectopia of the bladder in infants the ureters are dilated, but this is by no means a contra-indication for the operation.

An incision 3–5 cm. long is made in the parietal peritoneum above the ureter, which is isolated as low as possible near the bladder and cut between two silk ligatures. The vesical end of the ureter is touched with carbolic acid and the ligature cut; the stump disappears at the lower end of the abdominal incision. The temporary fixing ligature on the renal end of the ureter is left on, for it prevents the urine from dropping freely into the abdominal cavity, and also helps to keep the ureter close to the intestine for the anastomosis This is usually made in the pelvic colon. One ureter is laid above the other, the left being generally sewn in first. The assistant fixes with his left hand the part of the intestine where the ureter will be transplanted. The surgeon then pulls on the ligature and places the ureter so that it lies obliquely downward and inwards on the intestine, after which three serous sutures are made over the ureter as in Witzel's gastrotomy. The sutures should be placed on the seromuscular layers of the intestine and the adventitia of the ureter far enough apart to avoid pressure on the ureter. The part of the ureter held by the ligature is cut off obliquely so that the slit of the future anastomosis is oval. A sound 12–15 cm. long is introduced into the lumen of the ureter, and its patency is proved if some drops of urine flow out. Afterwards the cut part of the ureter is carefully lifted up with fine ophthalmic forceps, and the serous

and muscular layers of the intestine are incised under it The mucosa of the intestine is lifted up by the forceps as a little cone and the top of it is cut off with curved scissors The small amount of bleeding that sometimes occurs may easily be stopped by simple pressure The end of the ureter is then laid in the incision in the intestinal wall and is united with it by four fine silk sutures, thus forming an anastomosis It is this anastomosis that is the fundamental difference between Mirotvortzeff's and Tikhoff's methods The last stage of the operation is the insertion of several nodal sutures over the anastomosis

After washing his hands the surgeon goes over to the left side of the patient and sews in the right ureter in the same way The abdominal wound is then closed If the patient is a child we cover the wound with adhesive plaster or with broad gauze strips fastened with collodium and then with aseptic gauze A Nelaton catheter is placed in the rectum Owing to neglecting this last precaution we had two cases of intestinal eventration The oblique cut at the end of the ureters, by increasing the size of the opening, prevents contraction of the lumen and consequent ascending infection, it is also helpful technically in making the anastomosis Joining the "cup" of the ureter to the incision in the intestinal wall makes an ideal hermetic union

In Tikhoff's method the ureter is put freely into the rectum after the insertion of some Witzel sutures The absence of mucosa-to mucosa fixation may allow displacement of the ureters into the abdominal cavity This happened once in 90 operations in Tikhoff's cases, but was more common in animal experiments Mayo and Coffey do not use Witzel's sero serous tunnel, but incise the serous and muscular coats of the intestine and then place the ureter superficial to the mucosa They think that the intestinal gases press on the mucosa and thus narrow the wide opening in the ureter and that this may prevent ascending infection There are several objections to their method Uncontrolled and more or less prolonged closure of the sewn in ureters may cause retention of urine and consequent dilatation and atony of the ureters, thus the possibility of ascending infection is not excluded The scar in the intestinal wall over the ureter is considerably coarser when the seromuscular layer of the intestine is cut than when the ureter is placed in the sero serous Witzel tunnel With a skilful operator there is no danger of compressing the ureter in the Russian methods The insertion of a sound is a valuable precaution against obstruction

We regard Coffey's suggestion of putting a catheter into the lumen of the ureter and drawing it out through the rectum as an unnecessary technical complication of the operation He leaves the catheter in the ureters for 8–10 days and sutures the obliquely cut end of the ureter to the catheter with four nodal sutures The extraction of the catheter is a highly dangerous procedure, for the sutures that fix the ureter may easily be torn out and it is possible to damage the mucosa of the ureter itself In one woman who died from peritonitis 17 days after Coffey's operation the left ureter had been pulled 3 cm out of place, and it was gangrenous, we put this down to the presence and extraction of the ureteric catheter Another possible complication is blocking of the narrow catheter by urinary salts

INDICATIONS FOR TRANSPLANTATION

The indications for this operation are well defined

(1) Developmental defects of the bladder ectopia, high epispadias, and absence of the sphincter The operation may be performed even in the youngest infants

(2) Uretero vaginal and vesico-vaginal fistulæ

(3) Malignant and some benign tumours of the bladder

(4) Gunshot wounds of the bladder with multiple urinary fistulæ that do not respond to treatment

(5) Accidental injury to the ureter during pelvic operations when it is impossible to repair it or to transplant it into the bladder

Prof Oppel and Prof Mirotvortzeff are right in saying that these indications will in future be widened At first both authors expressed some doubt about the suitability of the operation in ectopia, the latter regarding Maydl's operation as irreplaceable, especially in children under five years, and in Tikhoff's series of 90 cases of transplantation into the rectum there were only 2 for ectopia We believe that ureter transplantation may ultimately replace Maydl's operation in all cases of ectopia We have proved the possibility of operating at the earliest ages Our youngest patient was five weeks old It is true we lost him, but only because of a fault in technique The operation wound was not covered with strips of adhesive plaster and on the fifth day there was intestinal eventration which required a new operation under chloroform narcosis The child died on the seventh day with symptoms of peritonitis, the ureteral anastomosis was seen to be sound

As early as 1908 Jelinek observed that if Maydl's operation was carried out in childhood there was less chance of an ascending pyelonephritis in later life We have the same impression and think therefore that one of the causes of ascending pyelonephritis in ectopia may be renal disease beginning at some time before the operation We cannot but agree with Prof Oppel that "transplantation of the ureters into the intestine more often aggravates an already existing ascending infection than is the primary cause of one" (Matoussoff)

Undoubtedly the operation is very serious in infants and has a considerable mortality, but ectopia is itself a very dangerous disease The gravity of the condition makes it important to remedy it as soon as possible for the parents' as well as for the patient's sake For the mother it is less hard to lose such a child in the first half year of its life than at the age of four or five We think the best age for operation is six months Technically at this age the operation is not difficult—for the ureters to be sufficiently dilated is rather the rule than the exception—and we have always found it possible to do Mirotvortzeff's anastomosis

TABLE I—FATALITIES IN CHILDREN AND ADULTS

Disease	Operations	Deaths (number and per cent)
Ectopia	12	4 (33 3)
Uretero vaginal and vesico-vaginal fistulæ	6	1 (16 6)
Gunshot wounds of bladder	1	0
Cancer of bladder	4	2 (50 0)
Total	23	7 (30 4)

CAUSES OF FAILURE

We have operated on ten children under four years for ectopia The immediate mortality was considerable Other deformities were present in 3 cases One fatal case had a patent ductus arteriosus; another a rictus lupinus; and in one patient who recovered there was bifurcation of the ureters in the lower part The fatalities in children and adults were as given in table I

TABLE II—RESULTS OF OPERATION. MIROTVORTZEFF'S METHOD

Disease	Cases.	Deaths	Fatality-rate (per cent.).
Ectopia of bladder—			
5 weeks–5 years	16	6	38·1
5 years–10 „	1	0	0 0
10 „ –20 „	15	1	10·0
Over 20 years	5	1	
Total	37	8	21 6
Cancer of bladder	20	10	50 0
Fistula of bladder	12	1	8·3
Tuberculosis of bladder	1	0	0 0
Obstinate cystitis	1	1	100 0
Total	71	20	28·1

The cause of death in two children was shock, and in two others peritonitis In one case of cancer of the bladder we lost a woman from peritonitis. In another a woman died from acute cardiac failure some hours after the removal of the bladder together with all the internal reproductive organs and the transplantation of the ureters; here it would have been better to have operated in two stages We lost one patient after Coffey's operation on the 17th day from peritonitis; the left ureter was gangrenous for 3 cm.

TABLE III—TIKHOFF'S RESULTS

Disease.	*Cases.*	*Deaths*	Fatality-rate (per cent.)
Vesico-vaginal fistula	53	12	22 6
Cancer of uterus and bladder	33	17	51·5
Ectopia	2	2	
Sphincter weakness	1	1	100 0
Tumour of bladder	1	1	
Total	90	33	36 6

upwards from the place where it was sewn in and was lying loose in the abdominal cavity; we consider that this happened because a foreign body—a catheter—was kept in the ureter When he first began his method Coffey had to extract the catheter on the fourth day because it became blocked. In one of our cases we had to extract the catheter on the seventh day after a Coffey operation. Generally it comes out between the eighth and 16th days. To prevent the catheter becoming blocked by urine salts it is advisable to use aspiration, to wash it through with boric solution, and pass a special stilette down it. Extracted catheters usually show thick deposits of urates We regard our method as the simplest and surest way of preventing this.

One death after operation was extremely instructive. A woman aged 28 had had a vesico-vaginal fistula for eight years. The ureters were transplanted into the rectum, and urine began to flow within half an hour after the operation. For five days her condition was satisfactory; then she had severe meteorism, her eyes began to roll up and her nose became sharp, but her pulse was of a good tension at 80–90 a minute, and the abdomen was painless on palpation. Thus the clinical picture was not a clear one of peritonitis. The possibility of a leak in the anastomosis was considered but the daily secretion of 1500 c.cm. of urine allayed anxiety to a certain degree, although between the third and seventh days after these operations there should always be a considerable polyuria (amounting to 3–5 litres a day). The meteorism was increasing every day, and siphon enemata, injections of atropine and pituitrin, and intravenous injections of 10 per cent. saline all failed to give relief. On the 11th day there was clearly intestinal obstruction, with absolute constipation and continuous vomiting A second laparotomy was performed. On removing the first sutures from the abdominal wound a transparent light yellow fluid resembling ascitic fluid flowed out. There was absolutely no urinary smell in this liquid and for that reason it was thought to be ascitic; the laboratory afterwards, however, proved the presence of urinary salts in it. The wound was reopened completely. There were no signs of peritonitis, the intestines being all equally distended, and attempts to find a mechanical obstruction failed. The peritoneum was found to be plastered over the anastomosis and no displacement or perforation was seen. The wound was closed with drainage. The

TABLE IV—RESULTS FROM RUSSIAN AUTHORS (SMITTEN)

Disease	Recovery	Deaths	Total	Fatality rate (per cent.)
Fistula of bladder	125	37	162	22 84
Malignant tumour	37	61	98	62·25
Congenital deformity	41	18	59	30·51
Inflammation	1	3	4	75·0
Total	204	119	323	36 84

patient died with symptoms of cardiac failure 36 hours after this second operation

Post mortem it was established that the right ureter was sewn in higher than usual and its direction was not from above downwards. As a rule the ureter must meet the intestine at an obtuse angle; but in this case it was inserted in an upward direction at an acute angle. The result was a kink of the ureter followed by insufficient nutrition of its wall and a small leak at the anastomosis.

The conclusions to be drawn from this unfortunate case are as follows: (1) The details of this operation

TABLE V—RESULTS FROM RUSSIAN AND FOREIGN AUTHORS (SMITTEN)

Disease.	Fatality-rate (per cent.)	Total cases
Fistula	22·8	214
Congenital deformity	27 6	315
Neoplasm	56 6	181
Inflammation	53·3	15
Total	33 6	755

are clear and the rules of operative technique must be followed; the ureter must be sewn in from above downwards without any kinks (2) With extravasation of urine into the abdomen there is a characteristic picture of paralytic intestinal obstruction with a relatively good pulse. (3) Between the third and seventh days after operation there must be polyuria; even a normal output should lead one to suspect leakage at the ureteric sutures (4) Urine extravasated into the abdominal cavity does not have the characteristic odour. (5) If the patient survives a leakage of urine for 10 days the second operation should be limited to draining the abdomen through a small incision only.

RESULTS OF THE OPERATION

In table II a summary is given of the statistics of recorded cases operated on exclusively by Mirotvortzeff's method. Tikhoff's results are shown in

table III, and those collected by Smitten from Russian and foreign sources in tables IV and V

On comparing these collected statistics it will be seen that the total fatality rate in operations by Mirotvortzeff's method is 5–8 per cent lower than in the others Such comparisons may however err through differences in the clinical material

TABLE VI

Period under observation	Successful cases	Period under observation	Successful cases
0–6 mths	72	3– 5 years	26
6 mths –1 year	47	5–10 „	21
1–2 years	60	10–20 „	19
2–3 „	31		

Many women who have had their ureters transplanted live a long and painless life Women who have undergone such an operation in early childhood have often been able to work hard and have successfully given birth to a child Cases have been reported where childbirth was fatal, and we have also had experience of this Smitten was right in saying that even when the kidneys are healthy it is wiser, in some cases at least, to sterilise the patient

The remote results of 740 operations of transplantation of the ureters into the rectum or of Maydl's operation reported by Smitten were as given in table VI These statistics prove once more what a valuable procedure this is in the relief of the distressing condition of urinary incontinence

The remote results are known in about half of our cases (table VII)

One of our patients became pregnant nine months after the operation Owing to renal insufficiency a vaginal cæsarean operation was performed In the following months she had periodic exacerbations of the pyonephrosis and she died 15 months later with symptoms of uræmia The post-mortem examination showed bilateral pyonephrosis, the lumina of the ureters being quite patent In this case there had been a fault in operative technique, the fallopian tubes being closed with only one ligature so that they soon became potent again

All patients learn to distinguish between urination and defæcation, even in the first few weeks They find that they can easily hold up to 200–300 c cm of urine, and develop a different type of reflex for defæcation

Among the patients operated on by Mirotvortzeff's method three were kept under observation for long

TABLE VII

Period under observation	Cases	Result
5– 6 mths	3	One child died of one of the ordinary infectious diseases, two are healthy
15–18 „	2	One woman died of uræmia after pregnancy one healthy
2–2½ years	2	Healthy
4–4½ „	2	Healthy
19½ „	1	Died of calculous pyonephrosis

periods: one for 15½ years, a second for 19½ years, and a third for 20 years Oppel[1] describes the case of a child of 8 years who was operated on for ectopia of the bladder in 1913, Mirotvortzeff's method being used In 1929 the bladder was extirpated In these 15½ years the patient had felt perfectly well At the Leningrad Pirogoff Society in 1933 Moukharinsky reported a case in which the patient had lived for 20 years after such an operation, and in whom no renal or renal pelvis symptoms had appeared The history of our longest case was as follows

A woman aged 38 was admitted to Mirotvortzeff's clinic on Sept 20, 1930, with symptoms of pyelonephritis Oppel had transplanted her ureters in 1911 because of absence of the bladder sphincter The patient lived 15 years without any complaints and became pregnant four times, an artificial abortion being performed each time The excretion of urine and fæces were separate and called forth by different reflexes The patient lived mainly on vegetable and milk food, she was less fond of meat than before the operation, but more partial to sour foods such as sauerkraut or lemons Her first serious trouble was 16 years after the operation, when she had moved to some northern place and was living in poverty in bad hygienic conditions in damp lodgings At this time she had to keep her bed for 6 months with symptoms of pyelonephritis She kept fairly well after this for 2 years, when the same disease recurred This was followed by an interval of 1½ years and then a fatal recurrence At the post-mortem examination there was a right-sided paranephritis, an abscess and calculus of the right kidney, and an abscess of the liver formed by extension from the paranephritis If we had recognised and opened the paranephric abscess in time it is very probable that the patient would still be alive

CONCLUSIONS

1 The operation of transplantation of the ureters into the rectum in cases of ectopia of the bladder may be performed on the youngest children

2 The remote results of the operation are best when the operation is performed in childhood

3 Clinical observations show the possibility of a trouble-free life for many years after transplantation, but patients must keep to a special diet and take every precaution against damage to the kidneys

4 Mirotvortzeff's operation shows the lowest direct mortality of the methods in use

1 Oppel V A., *Vestn. Khir* 1929 18, 7

ANALYSIS OF THE NORMAL P WAVE

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FOR analysis of the P wave the same material was used as for the Q R S deflection[1]

The P wave is comparatively simple Throughout the whole of it the lower part of the chest wall is positive to the upper part; and in the lower part the front is slightly positive to the back The upper part of the chest is also very nearly iso electric in this subject, but at first the clavicular regions on both sides are slightly positive to the scapular, becoming distinctly negative at the height of the wave In leads taken from front to back in these regions the P wave, though very small, is unmistakably diphasic The two stages are shown in figs 1 and 2 In the first stage the voltages are so small and vary so much with respiration that anything like accurate measurement is impossible, the total range does not exceed 1·5 decimillivolts The continuous line in fig 1 roughly indicates the boundary between positive and negative and the depth of shading and stippling the degree of positive and negative potential respectively In the second stage more detail is possible, but even so the total range is not more than 3·5 decimillivolts,

1 Hill A *Lancet* 1938, 2, 1116

and the contour lines are only to be taken as approximations.

It is evident that the most positive area in this subject is more centrally placed than usual, for his standard electrocardiogram shows practically no

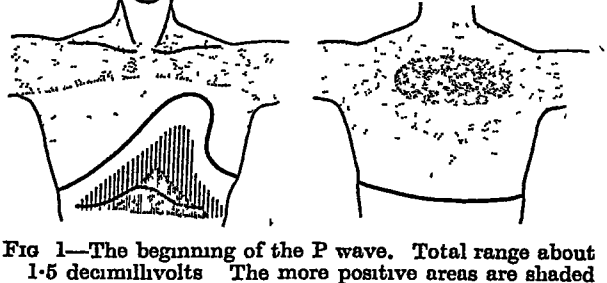

FIG 1—The beginning of the P wave. Total range about 1·5 decimillivolts The more positive areas are shaded and the more negative stippled

P wave in lead I, while it is well developed in the other two leads This may be due to the very thick layer of muscle overlying the apex and præcordium. The voltages recorded by the instrument are "surface" voltages and are approximately proportional to Vr/R, where V is the "intrinsic" voltage at the site of the contraction wave, r the resistance of that part of the circuit which lies between the points of application of the electrodes, and R the resistance of the whole circuit from one side of the contraction wave to the other through the conducting paths to the surface and the intervening length of thoracic wall. Anything that increases R—e g , interposition of fluid between the heart and the chest wall, or greatly increased thickness of the chest wall—will diminish the surface voltage, though the intrinsic voltage remains unchanged. This would account for the low voltages found in pericardial effusion, without the necessity of invoking "tamponnade."

The mechanism of production of the P wave is easy to understand if we think of the contraction wave as a ring of small batteries travelling down the auricles with their positive poles in front and their negative poles behind. When the wave is starting on its journey from the sinus venosus, the whole of the auricular and ventricular blood in front of it will be positive and the blood in the superior vena cava and its tributaries negative. As the ring of batteries advances towards the A–V junction (fig. 3), more and more of the auricular blood will become negative; and, when it finally reaches its destination, just before it ceases to generate electricity, the whole of the blood in the auricles will be negative, while the ventricular blood is still positive. The positive electricity is conducted to the surface through the præcordium and the liver, and the negative to the root of the neck through the auricles and great veins.

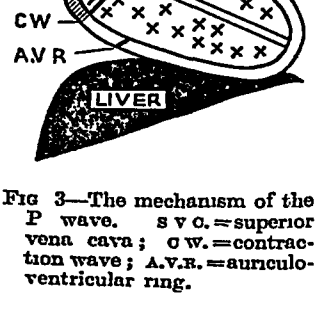

FIG 3—The mechanism of the P wave. S V C.=superior vena cava; C W.=contraction wave; A.V.R.=auriculo-ventricular ring.

This mechanism differs in one particular from that which produces the Q R S deflection In the latter the contraction wave, travelling mainly from within outwards, creates a potential difference between the chest wall and the blood column as a whole; the auricular contraction wave, sliding down over the upper part of the blood column like a sleeve or bracelet, creates a potential difference between the two ends of the blood column If these two events take place simultaneously, the currents will be superimposed and the resulting voltage will be the algebraic sum of the voltages of each wave; the condition is comparable to two batteries connected in series, and the P wave will be superimposed unchanged on the Q R S. But this rule of algebraic summation of simultaneous deflections does not apply to those produced by contraction of the two ventricles, for these are comparable to two batteries connected in parallel; and this does not result in summation of voltage. Thus, though the bi-cardiogram is, in a sense, a combination of dextro- and lævo-cardiograms, it cannot be their sum or even the resultant of their components along some particular axis So, as suggested in my earlier paper, the concept of axis-deviation needs reconsideration. Hypertrophy of a ventricle wall will increase the duration of the current due to its activity, for the contraction wave has further to travel; it is not safe to assume that it will increase its voltage without direct experimental evidence. It seems more likely that the changes in

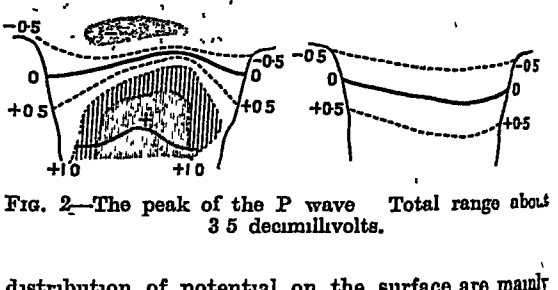

FIG. 2—The peak of the P wave Total range about 3 5 decimillivolts.

distribution of potential on the surface are mainly caused by the effects of associated anatomical displacements on the conduction paths.

This analysis throws some light on the correct method of measuring the P–R interval It is always measured from the beginning of the P wave to the beginning of the Q R S deflection It will be clear that in any particular lead a deflection may appear later than the current giving rise to it if the two points of application happen at first to be iso-electric, but, if three triangulated leads are taken, the deflection can only be late in one of them, except in the rare instances when it is late or even absent in all three It cannot be punctual in one lead only and late in the other two. It follows therefore that in the standard electrocardiogram there must be one lead at least in which both the P and the Q R S are punctual, and this will give the true reading. If in one of the other leads P is late and Q punctual, the interval will be artificially shortened, but, if P is punctual and Q late, it will be artificially lengthened. When, therefore, the measurements in the three leads are all different, the intermediate value (not the longest) is the true one; but, if two agree and one is different, the two that agree are right, whether the third is shorter or longer. This rule does not apply to measurement of a deflection (when the longest value should be taken) or of an interval measured from the end of one deflection to the beginning of the next (when the shortest value is right)

SUMMARY AND CONCLUSIONS

(1) Charts of the potential distribution on the surface during inscription of the P wave are given, and the mechanism of its production is discussed

(2) The conditions necessary to summation of deflections are considered

(3) The measurement of the P–R interval is examined

MALNUTRITION AND DEBILITY IN PUERPERAL PSYCHOSES

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It is now generally accepted that there is no specific form of mental disorder associated with childbirth and that when mental illness begins during pregnancy, the puerperium or lactation, childbirth acts as any other factor might in precipitating one of the recognised forms of insanity There are, however, in connexion with this particular factor of childbirth certain points worthy of consideration which are not always present in the case of other precipitating factors First, it may be noted from the literature on the subject that it is very often associated with some other contributory cause, and the fact that many of these women have already had one or more confinements, and that many of them pass normally through later confinements, suggests that some other factor of a temporary

TABLE I—WEIGHTS ON ADMISSION

Diagnosis	Total cases	Normal	Above normal	Total	Below normal			Total
					4–7 lb	7–13 lb	1 st or more	
Man depressive	38	6	3	9	9	8	12	29
Schizophrenic	21	2	1	3	2	4	12	18
Confusional	9	1	1	2	1	2	4	7
Total	68	9	5	14	12	14	28	54

nature—i e, arising in connexion with this particular pregnancy—is involved Secondly, during the period of pregnancy, the puerperium and lactation, patients are or should be, under the supervision of their own doctor or of an ante and postnatal clinic, so that if any contributory factor can be found whose elimination will help to minimise the risks of childbirth for potential psychotics, prophylactic measures should here be especially possible In a review of 35 cases of mental illness associated with childbirth, in 28 of which additional precipitating factors are stated to have been present Harris (1936) finds that their presence or absence does not appear to influence the patient's chances of recovery It is, however, possible that without an additional factor the mental illness might never have arisen at all

The most important thing in the study of these contributory causes is the recognition of those which might be eliminated Some such as hereditary predisposition and life long nervous instability, cannot be removed but a knowledge of their presence in the early days of pregnancy should suggest an especial effort to build up the general powers of resistance and to eliminate additional preventable factors Of the preventable contributory causes it is suggested that the two most important are (1) malnutrition and general debility, and (2) stress and anxiety, emotional or environmental The following observations on 117 cases of mental illness arising in connexion with childbirth, who were admitted to Severalls Mental Hospital over a period of fifteen years, show how common these factors are All the patients except 6 were admitted during the late months of pregnancy during the puerperium or during lactation In every case this was the first occasion on which the patient had been admitted to a mental hospital, 72 of the patients recovered, 60 had already had one or more normal confinements, and 12 have had one or more confinements since their discharge from hospital without developing any mental symptoms

WEIGHT AND GENERAL HEALTH

The weight on admission to and discharge from hospital was noted in 68 cases A certain number of

TABLE II—ALTERATION IN WEIGHTS WHILE IN HOSPITAL

Diagnosis	Increase				No change or decrease
	4–7 lb	7–13 lb	1st or more	Total	
Man depressive	2	10	23	35	3
Schizophrenic	1	1	13	15	6
Confusional	1	6	2	9	0
Total	4	17	38	59	9

patients were not weighed on admission, some being too ill physically (20), others mentally The weights on admission have been compared with those given by Hutchison and Hunter (1938) as the average for normal women, age and height of course being taken into consideration The weights of 40 healthy members of the nursing staff approximated closely to this standard

The figures in tables I and II give some idea of the degree of malnutrition found in a great many of these women It will be seen that on admission 54 of the 68 cases (nearly 80 per cent) were below normal weight, 28 (41 per cent) being more than 1 st under weight, the remaining 14 patients were of normal or above normal weight

Table III shows the alterations in weight while in hospital of the 54 patients who recovered, and it

TABLE III—ALTERATION IN WEIGHTS WHILE IN HOSPITAL OF PATIENTS WHO RECOVERED AND WHO DID NOT RECOVER

Diagnosis	Recoveries		Not recoveries	
	Increase	No change or decrease	Increase	No change or decrease
Man depressive	32	1	3	2
Schizophrenic	12	0	3	6
Confusional	9	0	0	0
Total	53	1	6	8

will be seen that in every case except one recovery was associated with an increase in weight (over 1 st in 36 of the cases who were below normal on admission) while 8 of the 14 cases who did not recover showed no change or a loss of weight

Only 28 of the 117 patients (23·9 per cent.) were found to be in satisfactory general health when admitted to hospital, none of these showing any sign of physical disorder. The majority were suffering from minor physical ailments; 80 had dirty, furred tongues and were and had been suffering from constipation; over 60 had carious teeth or pyorrhœa or both; 32 were suffering from anæmia, and, as has been shown, a great many were poorly nourished and underweight

On admission 20 patients were seriously ill; these included 5 suffering from nephritis, 2 of them associated with streptococcal infection of the vagina; 2 eclampsia; 1 pyosalpinx; 3 toxæmia (2 associated with pyelitis); 2 lobar pneumonia; 1 bronchopneumonia; 1 phthisis; 1 severe anæmia; 1 valvular disease with anæmia; 1 follicular tonsillitis; 1 anæmia and ulceration of prolapsed rectum; and 1 hyperthyroidism. All had pyrexia on admission.

Less seriously ill but in poor physical condition were 11 cases of heart disease; 5 with a bloodstained vaginal discharge three or more weeks after confinement; 3 of arteriosclerosis; 3 of erosion of cervix; 3 of torn perineum; and 1 case of each of the following: vaginitis, breast abscess, nephritis, cystitis, bronchitis, pharyngitis, tonsillitis, otitis media, furunculosis, gingivitis, syphilis, measles, scarlet fever and thyroid deficiency.

In an address to the British Medical Association Dame Louise McIlroy (1937) suggested that "it is within the bounds of possibility that one of the determining causes of puerperal sepsis is defective nutrition with consequent lowering of resistance." It is also within the bounds of possibility that such defective nutrition with consequent lowering of resistance may play a considerable part as a determining factor in mental breakdown, especially in cases where nervous instability and environmental or emotional stress are also present.

STRESS

A history taken in the early days of pregnancy would have shown that 36 of these patients belonged to families in which a near relative had suffered from insanity, epilepsy or alcoholism; 29 had at some period in their life already shown signs of nervous instability; while 22 had undergone long and severe stress. The following records give some idea of what has been accepted as "stress" sufficiently severe to be a possible precipitating factor.

In 2 cases the patient's husband had been out of work for over two years; both these women already had three children and both owing to financial difficulties were themselves in an undernourished condition. A woman admitted during the puerperium suffering from measles had thirteen children, and had been nursing several of them with measles and running her home during her pregnancy. In another case the husband suffered from "shell-shock" and was in an acute anxiety state prior to and at the time of his wife's confinement which took place in her own home. Of the lactational cases, 2 were themselves in poor health but owing to financial difficulties were still nursing their babies a year after their confinements. A woman who had had a "nervous breakdown" seven years previously when she already had five children, and who had never really felt fit since this illness, had had two more children during these seven years but broke down at the birth of the eighth. Mentally abnormal relatives were living with 2 patients. Another lived throughout her pregnancy in constant fear of becoming like her mother, who had developed a chronic psychosis at childbirth when her own child was born In 1 case the husband, wife, a small child, and the newborn baby were living in one room Altogether 5 patients had given birth to illegitimate children.

It will be noted that in many of these cases the source of anxiety is also one of the sources of the mother's state of undernourishment and debility Jones pointed out in 1903 that the incidence of puerperal psychoses was considerably higher among the rate-aided patients than among those of the "private" class; the same fact has been recorded in reports of the Board of Control and it is also true for the present group of cases. The difference in incidence between the two classes is large and suggests that precipitating factors may be present in the one which are absent in the others; of these, the first that come to mind are malnutrition, and financial and general economic stress. Codet and Badonnel (1924) emphasise the importance of the mother's attitude towards childbirth; where it is a desired event, joyfully anticipated and not likely to lead to financial and other difficulties, there is much less likelihood of symptoms associated with anxiety and fear developing than where the child is unwanted or where the presence of another member in the family is going to be the source of financial difficulty or an added burden to an already overworked mother A friendly discussion, during the early months of pregnancy, of fears, anxieties, and emotional and environmental difficulties will in itself often do much to overcome them, and it will probably be possible to relieve at least some of the troubles brought to light in this way, and thus to reduce the stress and anxiety to which the patient is being subjected.

As has already been mentioned this group of potential psychotic patients is in a peculiarly favourable position for prevention, if such is possible, in that they are under supervision during the period immediately preceding the possible onset of mental illness, a time when prophylactic measures, both psychological and physical, may be of value, and when the earliest symptoms suggestive of mental breakdown—irritability, restlessness, undue fatigue, emotional instability and that almost universal early symptom insomnia—may be noted and dealt with. The opportunity is present for dealing with minor physical disorders and with sources of auto-intoxication, and much can be done to improve the general condition and build up powers of resistance

It will be seen that of the group here investigated a great many patients had had to cope not only with childbirth but also with an inherited instability and/or malnutrition and a poor physical condition, and/or considerable stress and anxiety Up to this time they had managed to cope with life (all were first admissions to hospital) and might still have done so if their physical condition, their power of resistance, and that "additional precipitating factor," stress and anxiety, could have been attended to in time

SUMMARY

Analysis of a series of cases of puerperal psychoses showed that the majority were much under weight and in poor physical health; about a quarter had been exposed to severe economic or emotional stress.

Many cases could probably be prevented by attention to nutrition, general health and environmental conditions early in pregnancy

My thanks are due to Dr. R C. Turnbull for permission to use the hospital records.

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AFTER-EFFECTS OF EXPOSURE OF MEN TO CARBON DIOXIDE

BY W ALEXANDER, B Sc, P DUFF, J B S HALDANE, F R S, G IVES, AND D RENTON

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IN connexion with the loss of H M submarine *Thetis*, it was desired to determine the effect on men of breathing oxygen in an escape apparatus after prolonged exposure to air containing high carbon dioxide and low oxygen The air in the submarine was under a pressure of about 8 cm Hg above the atmosphere, the volume per man being 4710 litres From the accounts of survivors it was judged that when they left the submarine after 17–18 hours' confinement the partial pressures were approximately CO_2 6 per cent, O_2 16 per cent, N_2+A, 87 per cent of an atmosphere

J S Haldane or Lorrain Smith (1894) breathed air in a closed chamber for 7½ hours until the CO_2 rose to 6 4 per cent, and the O_2 fell to 13 per cent On emerging he had a headache and vomited J B S Haldane (1924a, 1924b) had the same symptoms after 1½ hours' breathing air originally containing 5–6 per cent CO_2 and in which the CO_2 rose to a maximum of 7 3 per cent He always vomited when the final percentage exceeded 6 5

On the other hand Long (1924) had observed headache and nausea in two subjects breathing mixtures of CO_2 and O_2 in which the maximum CO_2 percentage was 11, and the maximum time of exposure fifty minutes He did not record any aggravation of symptoms on breathing fresh air, though the symptoms continued for some time The additional O_2 may have been responsible for this difference It was therefore considered probable that the men in the *Thetis* suffered from headache and/or vomiting on breathing pure O_2 in their escape apparatus, these symptoms being due to the sudden fall in the CO_2 and not to the rise in O_2 breathed However it was clearly desirable to find out whether an aggravation of symptoms was normal in such circumstances

THE PRESENT EXPERIMENT

Messrs Siebe Gorman and Co kindly put a steel chamber of 5800 litres' capacity at our disposal The conditions in the *Thetis* were duplicated as far as possible, the pressure being kept at about 1 1 atmospheres, and the CO_2 brought up to between 6 and 7 per cent, whilst the oxygen fell correspondingly The figures given for CO_2 are partial pressures, that is to say percentages multiplied by 1 1

A preliminary experiment was done to determine whether a gradual rise in CO_2 pressure had the same effect on J B S H as an abrupt rise

He let N_2 and CO_2 into the chamber at 10 10 P M and the pressure was adjusted so that the partial pressure of CO_2 was 2 5 per cent, that of O_2 being about 20 per cent The CO_2 then gradually rose and the O_2 fell owing to his breathing The pressure fell from time to time owing to a slight leak, but was kept up with compressed air, so that the ventilation of the air followed much the same course as in a submarine The dry bulb temperature varied from 70°–71° F the wet bulb being 2°–4° lower

J B S H slept intermittently from 12 30 to 8 30 A M when the CO_2 pressure was 5 1 per cent Panting was marked but there was no distress At 10 50 the CO_2 had reached 5 8 per cent and the panting was severe, with slight headache, photophobia, and transient nausea At noon the respirations were 44 per minute, but the pulse-rate was only 60, as compared with a normal figure of about 75 At 12 40 the CO_2 had risen to 6 6 per cent, and there was slight confusion, though the headache was not severe and there was no vomiting He left the chamber, and put on a Davis escape apparatus

After 2–3 minutes he removed the mouthpiece in order to vomit, which he did at intervals, probably bringing up about a pint of clear fluid He had not eaten or drunk for the previous sixteen hours, in order to parallel conditions in the submarine A violent headache developed, mainly frontal but somewhat diffuse This was severe for about an hour, and passed off about 5 P M Later he felt unusually well

Four days later all of us entered the chamber, and remained for one hour in air with a high CO_2 content and correspondingly low O_2 The partial pressure of CO_2 was originally 6 1 per cent, but rose rapidly After half an hour air was added and the pressure lowered, but at the end of the hour the CO_2 pressure had risen to 6 7 per cent Unfortunately duplicate O_2 determinations did not agree, and the partial pressure of O_2 may have been as high as 18 7 per cent

At the end of the hour all were panting severely, and P D, who was awaiting operation for the sequelæ of five wounds received in Spain, was in considerable distress On leaving the chamber all except J B S H put on Davis escape apparatus W A removed the mouthpiece almost instantly, and vomited repeatedly, though he had had no food since a light breakfast seven hours earlier, and is a good sailor and does not vomit readily in other circumstances He had a moderate headache P D and D R had very severe headaches developing within a few minutes, and both were temporarily incapacitated J B S H and G I had slight headaches developing after 10–15 minutes All had recovered after three hours

The slightness of J B S H's symptoms on this occasion suggests that the after effects depend on the time over which air containing above 5 5 per cent of CO_2 is breathed, rather than on the concentration at the end of the experiment It is however possible that on the occasion of the second experiment he was acclimatised to some extent In view of his experience in 1923 this is unlikely

DISCUSSION

In each of six persons who have breathed air containing CO_2 at a partial pressure of over 6 per cent with normal or subnormal O_2 for an hour, there has thus been an aggravation of symptoms other than panting, when air or O_2 was breathed, and three out of the six have vomited On the other hand there are marked individual differences in the symptoms J B S H's slight symptoms in the second experiment may have been due to his previous experience, but this could not apply to G I since none of the rest of us had ever taken part in tests of this kind Similarly P D's severe headache may have been partly due to his ill health But this could not apply to W A and D R

It will be remembered that at least one of the men who tried to escape from the *Thetis* pulled off the mouthpiece of his escape apparatus and was drowned, and that only 4 out of 103 succeeded in escaping It is suggested that some of the remainder were incapacitated by vomiting or other symptoms It seems that in such circumstances men should breathe air or oxygen for 30 minutes or more before attempting to use the escape apparatus under circumstances where vomiting is fatal, and where calmness and some physical exertion are required

It must however be emphasised that the experiments here described were conducted hurriedly,

so as to permit one of us to give evidence at the judicial inquiry. There can be no doubt that experiments more scientifically carried out, on larger numbers of men, would give more definite results. Moreover a careful investigation of the vasomotor and other changes involved might throw light on the causes of headache. This can hardly be due to a sudden increase in the alkalinity of the tissues. For J B. S. H. has frequently overbreathed so as to render himself so alkaline as to develop tetany and excrete a urine containing so much bicarbonate as to froth on adding acid. This has never produced a headache. On the other hand on one occasion he produced a severe acidosis with NH_4Cl He then ate about 40 g. of $NaHCO_3$ to restore his pH to normal This produced a severe but transitory headache, perhaps analogous to that here described.

SUMMARY

After breathing air with a partial pressure of over 6 per cent. of CO_2 for an hour or longer, five men experienced headache on breathing oxygen, and two of them vomited. The bearing of this observation on escape from submarines is discussed.

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ANTITUMORIGENIC ACTION OF PROGESTERONE

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UTERINE and extra-uterine abdominal fibromyomas produced in the guineapig by subcutaneous injection of follicular hormone develop in the non-castrated female with less constancy and in a lesser degree than in the castrated female (Lipschütz and Iglesias 1938, Lipschütz and Vargas 1939a and c). The difference in behaviour of castrated and non-castrated females is statistically significant (Lipschütz, Murillo, Vargas, and Koref 1939) and suggests that the antitumorigenic action of the ovary is due to the luteal hormone. This is corroborated by the following experiments.

Five castrated female guineapigs (225–475 g.) received subcutaneous injections of 80 µg. of œstradiol (the benzoic ester in olive oil) thrice weekly. Two of these animals were treated for 47 days and three for 90 days All the animals revealed at autopsy uterine or extra-uterine tumours (figs. 1 and 2).

Five castrated female guineapigs (385–510 g.) were treated in the same way and with similar quantities of the benzoic ester of œstradiol. After 30 days three subcutaneous injections of 12 mg. of progesterone in olive oil were given weekly besides the 80 µg. of œstradiol. Two animals were killed after 47 days and three after 90 days. Only one animal (treated for 47 days) developed uterine tumours (fig. 3); there were no tumours, uterine or extra-uterine, in the four others The total quantities of progesterone given were 84 mg. in 17 days and 288 mg. in 60 days; the relation between œstradiol and progesterone per injection was 1 to 150.

Most female guineapigs treated for two to three months with an ester of œstradiol show, besides uterine and extra-uterine tumours, also a remarkable development of hard fibrous tissue in the mesentery,

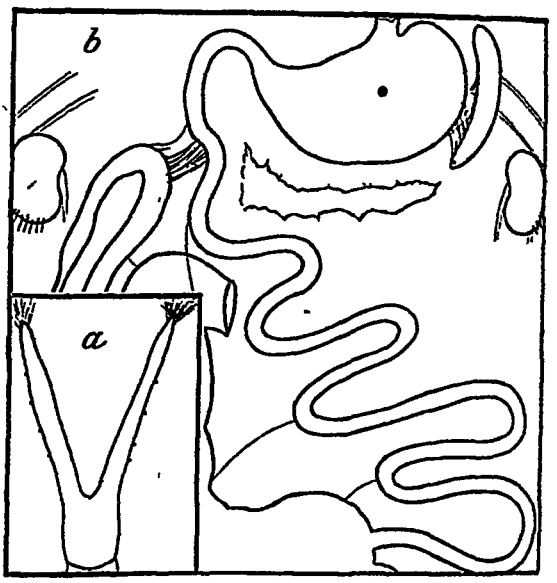

FIG 1—Diagram showing sites of uterine and extra uterine fibroids in a castrated female guineapig which had received œstradiol benzoate 80 µg thrice weekly for 47 days. (*a*) small parametrial tumours, mark 0·5 and apical uterine fibrosis, mark 0 5, (*b*) fibrosis round kidneys, in mesentery, and between stomach and spleen, subserous gastric tumour, mark 1, and small tumours on surface of spleen, mark 0 5 Total mark 2 5

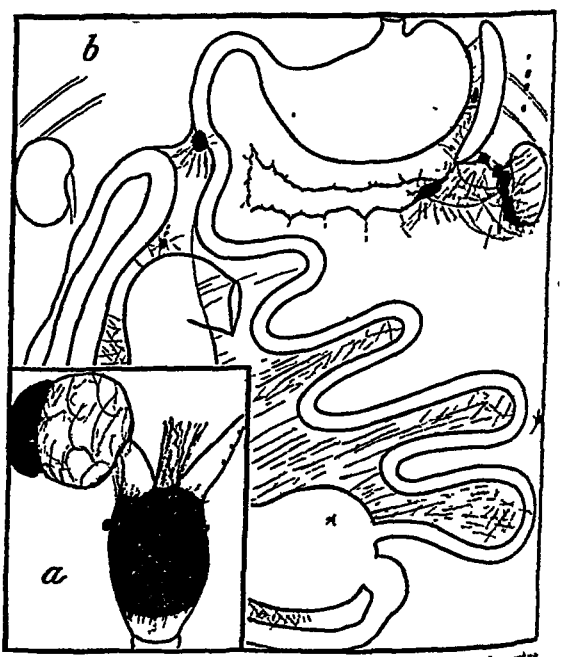

FIG 2—Diagram showing sites of uterine and extra uterine tumours in a castrated female guineapig which had received œstradiol benzoate 80 µg thrice weekly for 90 days · (*a*) enormous tumour of ventral surface of uterus, mark 3, with adhesion of the epiploön, small parametrial tumours, and cystic dilatation of right tube with big tumour, mark 3; (*b*) tumours in mesentery, hilum of left kidney, and abdominal wall, mark 2, in hilum of spleen, mark 1, and fibrosis of mesentery, mark 0 5 Total mark 9 5

round the spleen and kidneys, and elsewhere This fibrous reaction was present also in the animals receiving œstradiol and progesterone but in a smaller degree than in those animals receiving only œstradiol

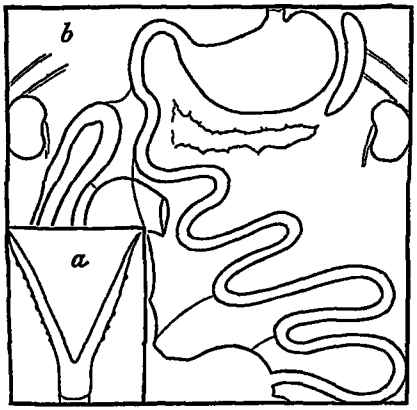

FIG 3—Diagram showing sites of uterine and extra uterine tumours in a castrated female guineapig which had received œstradiol benzoate 80 µg thrice weekly for 47 days and simultaneously during the last 17 days progesterone 12 mg thrice weekly (*a*) small parametrial tumours, mark 1, (*b*) small tumours on spleen, mark 1 Total mark 2

For the purpose of comparison we use a system of marks for tumours and fibrous tissue (Lipschütz and Vargas 1930b) The average mark of the group receiving only œstradiol was 4, the average mark of the group receiving œstradiol and progesterone was 1

Our experiments with progesterone, though few, suggest strongly that this substance exerts an anti tumorigenic action The quantity of progesterone necessary to suppress completely the tumorigenic action of œstradiol benzoate is more than 150 times greater than that of the latter According to Courrier and Cohen Solal (1937) the œstrogenic action of œstradiol also is suppressed by a quantity of progesterone 200 to 400 times greater than that of the œstradiol

Our results support the hypothesis that the development of uterine fibromyomas in women is due to a disturbance of the normal balance between follicular and luteal hormones and of their normal timing (Lipschütz 1939), and that progesterone may prove useful as a therapeutic agent against fibromyoma (*Lancet* 1939)

Our thanks are due to Messrs Ciba, of Basle, and Laboratoires du Dr Roussel, of Paris, for the benzoic ester of œstradiol, and to Messrs Organon, of Oss (Holland), for the progesterone.

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AMYLOIDOSIS COMPLICATING STILL'S DISEASE

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THE following case presents unusual features in that diffuse amyloidosis developed in the course of Still's disease, there being no evidence, either during life or at autopsy, of suppuration, tuberculosis or syphilis

CASE RECORD

A girl aged 7 years was admitted to the Glasgow Royal Infirmary on April 21, 1932, suffering from pain and swelling of ankles and knees which had been present for six months Her mother said that since the child had had acute rheumatism at the age of 3 years she had been subject to vague pains in the limbs

On admission she was well nourished but small for her age There was some swelling of knees, ankles and tarsal joints of both feet, but no tenderness or limitation of movement Radiography of joints showed no abnormality Her tonsils were enlarged and the fauces were congested The abdomen was normal and the cardiac sounds were pure Her temperature rose to 99° F on three occasions during her seven weeks' stay in hospital, but otherwise there was no pyrexia The urine was normal

In August, 1932, little change was noted on physical examination, but by November her general condition had deteriorated Her wrists were swollen as well as her knees, ankles and tarsal joints and the tonsillar lymphatic glands had become palpable Between November, 1932, and March, 1933, various signs appeared suggesting an "infective" source of her arthritis For six weeks there was continuous irregular pyrexia up to 102° F uninfluenced by sodium salicylate On two occasions she had a fleeting erythematous rash and the spleen became palpable She had a slight degree of anæmia (Hb 82 per cent, red cells 4,170,000) and a polymorph leucocytosis (25,800 per c mm, polymorphs 78 per cent). However, by March, 1933 her general condition showed improvement She spent the remainder of 1933 partly in hospital and partly in a children's home in the country By the end of the year the proximal interphalangeal joints of the index and middle fingers had become affected and there was stiffness of the cervical spine At this time her tonsils were removed

The next three years were spent in the country On Oct 6, 1936, she was readmitted to the Infirmary, when it was evident that the disease had not been arrested by tonsillectomy and abundance of fresh air and sunlight She was now 11 years old small for her age but well nourished in face and trunk Her limbs had lost much muscle substance and there was also some atrophy of the small muscles of the hands She had a typical rheumatoid deformity of the fingers and hands The wrists and elbows were moderately swollen and early contractures prevented full extension of these joints There was fullness of knees and ankles with slight limitation of movement Radiography showed osteoporosis The lymphatic glands of neck, axillæ and groins were now palpable, the spleen had increased in size and the edge of the liver could just be felt There was no ascites and, apart from a systolic murmur of functional type, cardiac examination was negative Leucocytosis persisted (21,000 per c mm polymorphs 85 per cent) and the anæmia had increased (Hb 60–65 per cent red cells 3,970,000–4,000,000) Blood-culture and Wassermann reaction were negative The fundi were normal In October and November she ran a

slight pyrexia, which occasionally reached 102° F. at night. Thereafter her temperature was normal, except for several days in February, 1937, until the few weeks preceding her death at the end of March, 1937, when it again rose. Her pulse-rate varied from 86 to 130 per min. during her pyrexial periods, remaining fairly constant at 110 per min. at other times

Her urine was normal in October, 1936. During her intermittent fever it contained a trace of albumin, which slowly increased after her temperature had returned to normal so that it could evidently not be interpreted as a febrile albuminuria. For three months the albuminuria was moderate (Esbach 1–8). With the slight pyrexia in February, 1937, the albuminuria increased and during the seven weeks before her death the Esbach readings showed striking daily variations (2 to 24). In spite of such gross albuminuria casts were notably scanty. From time to time the centrifuged deposit contained a few granular or hyaline casts. There was no hæmaturia and the specific gravity was normal. The urinary output varied considerably; as late as March 6 the day's volume was 2300 c.cm. Slight ascites was noted in November, 1936, but it was not until two months later—after ten to twelve weeks' frank albuminuria—that œdema of face and limbs was found. Following the brief fever in February, 1937, the œdema and ascites increased considerably. Paracentesis of the abdomen was performed on two occasions, 40 and 45 oz. of clear fluid being withdrawn, containing protein 220 mg., sugar 108 mg., and chlorides 662 mg. per 100 c.cm. Her blood-pressure showed a slight rise from 90–100/60 in October, November and December to 110/70–80 in January, February and March.

From March 18, 1937, abdominal pain became increasingly severe and she required frequent doses of Nepenthe. She vomited several times daily. On March 25 her facies was hippocratic. Apart from two occasions in the last week when she was stuperose, she remained conscious until she died on March 29.

POST-MORTEM EXAMINATION

The body was very œdematous, the œdema involving the arms, legs and trunk. The heart was slightly dilated, the myocardium being pale and soft; the valves and coronary arteries were healthy. Both lungs were œdematous. The peritoneal cavity contained a quantity of turbid fluid. The liver was of a firm, rubbery consistence and gave a strong amyloid reaction with iodine. The alimentary canal presented no abnormality. The spleen was firm and gave a strong amyloid reaction of the sago type with iodine. The kidneys were pale, the capsules stripped easily and both organs gave a strong iodine reaction for amyloid. The suprarenal glands appeared to be normal but were not examined for amyloid. The brain presented no abnormality. The knee- and ankle-joints were swollen and the periarticular tissues were thickened and adherent. The cartilages of the knee-joints were eroded and the synovial membranes were opaque and thickened.

HISTOLOGY

Liver.—The parenchyma cells were separated into small groups by a homogeneous, eosinophil substance which gave the characteristic amyloid staining reactions with iodine, gentian violet and Congo red. This substance was most plentiful around the central veins of the lobules although it did not actually involve them, but was laid down in the walls of the liver capillaries. From the central parts of the lobules the amyloid material spread peripherally.

Spleen.—The malpighian bodies were enlarged, consisting almost entirely of amyloid substance, which extended into the pulp for some distance, compressing the surrounding reticular tissue. The central arterioles were in the main free from amyloid but a few showed a deposit of it in their walls

Kidneys.—Many of the glomeruli were fibrosed and destroyed. Of the remainder, the majority presented a rich deposit of amyloid in their capillary walls; in the medulla, amyloid was present in the walls of many of the inter-tubular capillaries. A very small quantity was also present in the walls of a few capillaries in the thyroid gland and in the submaxillary salivary glands. None, however, was detected in the stomach wall, the cervical glands, the heart muscle or the periarticular tissues of the knee-joints.

DISCUSSION

Amyloid disease is a well recognised sequel to chronic suppurative diseases but it may also follow chronic non-suppurative conditions and still more rarely it arises as an apparently primary phenomenon. The original classification into localised and general forms put forward by Wichmann (1893) was in general use until Lubarsch (1929) distinguished a typical or commonly recognised form, and an atypical form. Various other classifications have been suggested and the most comprehensive appears to be that of Reimann and others (1935), who distinguished (1) primary amyloidosis, (2) secondary amyloidosis, (3) tumour-forming amyloidosis, and (4) amyloidosis associated with multiple myeloma. They admit however that there may be overlapping even in this classification

In the primary form the tissues affected in the more common secondary form are not involved, the amyloid process affecting mesodermal tissues, especially those of the cardiovascular system, gastro intestinal tract, smooth muscle and lymph nodes, the amyloid material also shows variations in staining reactions and tends to form nodular deposits. Pseudo-sclerema and macroglossia are usually present (Pick 1931). This type is relatively rare, only about 35 cases having been recorded by Strauss (1933)

The secondary type is by far the more common. Here the amyloid is deposited in the liver, spleen and kidneys and gives the typical staining reactions. Tumour-forming amyloidosis tends to resemble the primary type in distribution but actual tumour masses consisting of amyloid substance are formed. Amyloidosis associated with multiple myeloma is a comparative rarity, 37 recorded cases being reviewed by Magnus-Levy (1933); the distribution here also resembles that of the primary type

The present case is an example of the secondary type, and is remarkable in that there was no evidence of any of the primary diseases commonly associated with amyloidosis. Perla and Gross (1935), in reporting 3 unusual cases of amyloidosis, describe that of a girl aged sixteen years who had a ten-years history of recurrent attacks of arthritis. At the time of death her right elbow-joint was ankylosed because of thickening and shortening of the capsule but there was no evidence of suppuration; extensive deposits of amyloid were present in the liver, kidneys and suprarenal glands and death was due to uræmia. This case is comparable in certain respects to that described here. Both patients were young girls, both had a long history of arthritis with repeated short pyrexial attacks and both finally manifested some of the symptoms of chronic nephritis with œdema.

We are indebted to Prof. J. W. S. Blacklock for his helpful criticism and to Prof. A. W. Harrington for permission to publish the case.

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ANTIPELLAGRIC PROPERTIES OF QUINOLINIC ACID *

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Bills, McDonald and Spies (1939) have shown that pyrazine monocarboxylic acid and pyrazine 2 3-dicarboxylic acid are antipellagric substances Woolley, Strong, Madden and Elvehjem (1938) have reported that quinolinic acid, the 2 3 dicarboxylic acid of pyridine, does not cure canine black tongue Recently Dorfman, Koser and Saunders (1938) and ourselves have found that quinolinic acid is effective as a *growth factor for the dysentery bacillus in synthetic* amino acid medium Because of the apparent variations in the response of *different species*, and because of the chemical relationship between pyrazine 2·3 dicarboxylic acid and quinolinic acid, we studied the response of seven selected pellagrins in relapse to quinolinic acid (Eastman)

Each of six patients who had moderately severe symptoms of pellagra received 1000 mg orally, in *divided doses, over a period of five hours* In every case response was dramatic The fiery red glossitis and stomatitis faded within six hours after the first dose of quinolinic acid was given, and the tongue and mucous membranes regained their normal colour at the end of twenty-four hours The burning sensations subsided, and the patients reported increased strength and sense of well being *following treatment* One of these patients was confused, apprehensive, nervous, and emotionally unstable These symptoms were less noticeable within three hours after the administration of the first dose of quinolinic acid, and the patient appeared normal mentally *at the end* of twenty four hours One severely ill patient was admitted to the hospital and was given *1000 mg of* quinolinic acid each day for three days At the end of forty eight hours the colour of the tongue returned to normal, the Vincent's angina disappeared, and the macerated bullous dermatitis on the feet had begun to heal In the seven cases the concentration of co enzymes I and II in the blood increased from the low values found in pellagrins in relapse to normal values twenty four hours after quinolinic acid had been given

It has been shown previously (Spies, Bean and Stone 1938) that pigments soluble in ether and having a reddish purple colour in 25 per cent HCl appear in the urine of pellagrins in relapse but that they are not found in the urine of dogs with black tongue The present study demonstrates another biological difference between human pellagra and canine black tongue Apparently, all the organisms which require pyridine nucleotides for normal cell respiration do not necessarily use the same pyridine derivatives for the biological synthesis of these nucleotides Such biological variations can be explained by differences in the ability of the organism to utilise these compounds

* This study was aided by grants to the University of Cincinnati from the Rockefeller Foundation and the John and Mary R Markle Foundation

SUMMARY

1 Quinolinic acid is curative for human pellagra
2 The concentration of co enzymes I and II in the blood increased following the administration of quinolinic acid
3 Studies are in progress to ascertain the comparative usefulness of quinolinic acid and other therapeutic agents specific for pellagra

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A CASE OF AYERZA'S SYNDROME

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MANY references have been made to a condition—variously described as atheroma of the pulmonary arteries (Rogers 1908), *cardiacos nigros* (Arrillaga 1913), Ayerza's disease (Warthin 1919), primary sclerosis of the pulmonary artery (Bedford 1927, MacCallum 1931), and syphilis of the pulmonary artery (Hare and Ross 1929)—in which the prominent symptoms are extreme cyanosis, dyspnœa, polycythæmia, *cough*, and *enlargement of the right* chambers of the heart, with ultimate cardiac failure

Rogers (1908) described 10 cases which at *autopsy* showed atheroma and dilatation of the pulmonary arteries for which no cause was found He suggested syphilis as a cause, owing to its prevalence in Bengalis, although only 2 cases showed definite post-mortem evidence of gummata Arrillaga (1913) credited Averza with describing the syndrome in an unpublished clinical lecture in 1901 and concluded that the causes of *cardiacos nigros* were chronic *pulmonary* diseases leading to emphysema, and that syphilis might be a predisposing factor Weber (1913) collected several cases in which he thought chronic pulmonary disease was a principal cause, and later (Weber 1920) did not think syphilis an important factor

Histological evidence of syphilis has been produced by Warthin (1919), Clarke et al (1927), Konstam and Turnbull (1929), and Hare and Ross (1929); but MacCallum (1931) reported a case in which the pulmonary vessels showed intimal thickening and a diminished lumen without any other morbid change Sokoloff and Stewart (1933) reported a similar example, which they described as hyperplastic sclerosis of the vessels Other non-syphilitic cases in which chronic pulmonary disease was present have been described by Clarke et al (1927) Bedford (1927), and Paine and Platt (1931) Reviewing 21 cases, Hare and Ross (1929) concluded that syphilis was the most important cause in older patients but that a primary sclerosis developed in *younger subjects* Fotheringham (1929) described an interesting case in which the pulmonary arterioles showed typical histological changes of thrombo angiitis obliterans, and Montgomery (1935) found thrombosis of branches of the pulmonary artery

Since 1930 there have been several contributions from South America (Ramos 1932, Blas Mola 1934, and, notably Castex and Capdehourat 1932, 1933, 1934, who with Munzel in 1937 considered the bronchial factor to be always an antecedent) Other cases are recorded by Samorici and Sack (1933), de Miguel (1935),

Legrand (1935), and others. Paretzky and Jorgensen (1936) considered the radiographic features to be a dilatation of the right ventricle and pulmonary artery and a movement of the diaphragm synchronous with systole and diastole ("dance of the diaphragm") superimposed on the respiratory movements. Kerley (1936) said that sclerosis of the smaller vessels appeared as small, round, and sharply defined opacities bigger than miliary tubercles, decreasing in size towards the periphery, and that the appearance closely resembled pneumoconiosis but could be distinguished from it by the absence of emphysema. In Ireland Freeman (1935) reported a case with a positive Wassermann reaction but no histological evidence of chronic disease of the lungs or pulmonary vessels. Rothschild and Goldbloom (1938) described the changes as an obliterating arteritis and suggested an allergic factor with vascular spasm from which pulmonary fibrosis developed secondarily. Atkinson (1938) surveyed the reported cases but came to no conclusion regarding the ætiology. Oszacki and Szczeklik (1938), following 19 cases to autopsy, found syphilis to be unimportant and could not distinguish between primary sclerosis of the pulmonary artery and sclerosis secondary to chronic cardiorespiratory disease. They concluded that sclerosis of the pulmonary artery did not necessarily produce the symptoms described by Ayerza.

CASE-RECORD

A caretaker, aged 51, had suffered from a cough on and off for years and was first admitted to hospital in January, 1937, being dyspnœic and very cyanosed. There were many expiratory rhonchi in the lungs and moist râles at the bases, with a moderate amount of sputum. After three weeks his bronchitis had cleared up and he was discharged although still slightly cyanosed.

He was readmitted in November, having had increasing dyspnœa on exertion for five weeks and swelling of the ankles, but no cough or sputum. His appearance was striking: an intense plum-coloured cyanosis, which was much aggravated by exercise and out of all proportion to the degree of dyspnœa. There was no clubbing of the fingers, the pulse was regular, and the heart was apparently not enlarged and gave no evidence of valvular disease. The lungs were emphysematous, and a few dry râles were heard at the bases. The liver was palpable and slightly enlarged but not tender. The spleen could not be felt. There was slight œdema of the ankles only.

A blood-count showed 126 per cent hæmoglobin and 7·5 million erythrocytes per c.mm. The Wassermann reaction was negative. Electrocardiography showed considerable right ventricular preponderance. Radiographically the heart did not appear to be enlarged. There was a general increase in the pulmonary vascular shadowing but nothing to suggest that it was due to anything other than vascular engorgement.

His condition improved and, although remaining very cyanosed, he was discharged after eight weeks without being distressed. He was again readmitted in April, 1938, suffering from gross failure of the right heart, intensely cyanosed, orthopnœic, with much œdema of legs and lumbar pads, and ascites. Death ensued in four days.

Autopsy (Dr. A. C. Counsell).—A well-nourished subject showing gross œdema of legs and scrotum. Each pleural cavity contained about one pint of clear effusion. There was much emphysema of the pulmonary apices and anterior borders, with bullæ. The lung substance was indurated and congested. There were severe tracheitis and bronchitis. Pus was expressed from a few areas in the bases. There was gross right-sided hypertrophy and dilatation of the heart, affecting auricle and ventricle. About one pint of clear peritoneal fluid was found in the abdomen. The liver was congested and the spleen enlarged, hard, and dark red.

Microscopical section revealed dilatation of the bronchioles, catarrhal desquamation of the lining cells, and a mucoid exudate in the lumina. There was fibrosis of the peribronchial tissue, an infiltration with chronic inflammatory cells, and a diminution in the bronchial musculature. The lung substance showed chronic venous congestion superimposed on a severe emphysema. There was no pulmonary fibrosis. The arteries showed much medial hyperplasia without any change in the intima.

COMMENT

Ayerza's syndrome has many constant clinical features, the degree of polycythæmia being the most variable. It is found in a variety of pathological conditions, most of the cases being associated with chronic cardiopulmonary disease. The histopathological feature most constantly found is a sclerosis of the smaller pulmonary vessels; but in some cases this is absent. It may be that these conditions are merely predisposing and that the fundamental cause is undiscovered, or, more probably, that there is nothing specific about the syndrome, which depends on a decreased pulmonary circulation. The term Ayerza's syndrome offers a convenient clinical description but does not denote a disease entity.

I am indebted to Dr. J. B. Cook, medical superintendent of the West Middlesex County Hospital, for permission to publish this case; and to Dr. T. Nelson, senior physician, and Dr. A. C. Counsell, assistant pathologist to the hospital, for their assistance.

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". . In the secondary schools, colleges and universities there are made available to students a vast array of courses for giving special training in almost any field one could wish to study. It seems surprising, however, that, of the students from these schools, so many of them seem to lack just what one would expect educated people to possess. They have such strong prejudices, political prejudices, social, religious, class and racial prejudices. They are so easily influenced and controlled by slogans, by propaganda and by dogma. They are so lacking in critical judgment, in poise, and so little given to looking for, and critically evaluating the evidence on both sides of a question. In fact, it often seems that people who have had a formal education are likely to have stronger prejudices, are less eager or less willing to hear both sides of a question than are those with less schooling. They are often more smug, more self-satisfied and less reasonable. This may be due to the fact that their training has made them complacent . . ."
Prof. OTIS F. CURTIS, *Science*, Aug. 4, 1939, p. 94.

CLINICAL AND LABORATORY NOTES

EFFECTS OF AN ARTERIOVENOUS ANEURYSM

By I DOUGLAS MILLER, F R C S
HON ASSISTANT SURGEON, ST VINCENT'S HOSPITAL, SYDNEY

In the following case an opportunity presented of studying the alterations in circulation produced by an arteriovenous aneurysm of considerable size

A man aged 43 consulted me because of an indolent ulcer over his left tibia, which had resisted all treatment and was enlarging It was associated with varicose veins He said that for twenty years he had had increasing palpitation and dyspnœa on exertion This had led to cessation of work two years ago, and since then he had led the life of an invalid He had been seen by many physicians, and his cardiac condition had been variously investigated and diagnosed as myocarditis

On *examination* I found in the region of Hunter's canal a most arresting thrill synchronous with the heart beat There was a small scar over the medial aspect of the thigh, and the patient said that twenty years previously a pea rifle bullet had entered here and traversed his thigh He had been aware of the thrill ever since but had not attached any importance to it In the upper part of Hunter's canal there was a very large compressible pulsating swelling A thrill was conducted from it down to the knee and could be felt all over the hypogastrium On auscultation the bruit, which sounded like a "train in a tunnel," was audible all over the abdomen and even in the upper part of the other thigh The superficial veins of the abdomen and lower part of the thorax were palpable, rather tortuous, and pulsating The patient had obvious bounding pulsation in the neck, a typical water-hammer pulse, and capillary pulsation

On compression of the arterial anastomosis he complained of intense discomfort in the head There was an immediate and most pronounced drop in the pulse rate The normal rate was 72, and immediately on compression the rate fell to 50 beats a minute The blood-pressure was that of an aortic regurgitation brachial 132/61, left leg 120/60, and right leg 100/110 On occlusion of the aneurysm the brachial blood-pressure changed to 143/92 This occlusion reduced the pulse-pressure by 20 mm Hg The blood pressure in the left leg, taken below the aneurysm, was very much less than the pressure in the sound leg The heart was enlarged, the apex-beat being 5½ in from the middle line Radiography confirmed this finding

When the patient was about to be operated on I introduced wide bore needles into the saphenous veins to observe venous pressure On the right it was 28 cm water, and on the left 36 cm water These readings are, of course, very high In an endeavour to find out the alterations of blood return to the heart Dr F Cotton, of the physiology department in the University of Sydney, obtained the following figures by the acetylene method oxygen consumption 248 c cm a minute, and cardiac output 6 1 litres a minute

At *operation* I exposed a very formidable set of blood vessels a vein as large as the normal inferior vena cava, extending from just below the inguinal ligament to the lower end of Hunter's canal, and an artery which appeared to be very much bigger than normal I considered it advisable to work with a tourniquet It was difficult therefore to be sure of the site or the nature of the anastomosis There were many small surrounding veins, which were rather adherent to the main vessels I was able first to isolate the vein low down in Hunter's canal and to separate it very gently from the artery up to a point where I thought the anastomosis was placed I then separated the vessels as high as possible and traced them downwards In this way I approached the communication from a safe distance both above and below The communication was not obvious, but the two vessels were attached side to side for about 1 5 cm Above this point the artery was twice normal size and below was much smaller than normal I performed a quadruple ligature and removed the vessels and anastomosis intact The remainder of the vessels retracted very much, and we were left with an empty Hunter's canal—a rather frightening sight

Effects of operation.—Immediately on removal of the tourniquet the leg flushed and became warmer than before operation The pressure in the saphenous vein dropped to 28 cm water, equal to the other side Within a few days the ulcer had healed After the operation the pulse rate was 88 the pulse lost its "water hammer" quality, the brachial blood-pressure was 130/90, the oxygen consumption was 251 c cm per minute, and the cardiac output was 3 8 litres per minute

Description of anastomosis.—The internal diameter of the arterial inlet was 12 mm and the outlet 4 mm The arteriovenous communication measured 10 mm in each direction

This case gave an excellent opportunity to study an arteriovenous defect which simulated an aortic regurgitation We were able to observe that, while the anastomosis existed, there was almost 100 per cent increase in the return of blood to the heart and a consequent doubled cardiac output

I am indebted to Dr F Cotton for his work on this case and to my house-surgeon Dr W P Ryan for making numerous observations

AN INSTRUMENT FOR CLEARING THE COMMON BILE-DUCT

By D LANG STEVENSON, F R C S
RESIDENT SURGICAL OFFICER AT SMITHDOWN ROAD HOSPITAL, LIVERPOOL

The removal of stones from the biliary tract is much simplified by the technique described here In the first case in which we employed the method a stone was impacted low down in the common bile duct The usual manipulations through an incision in the duct had failed to move the stone at the ampulla, so that a trans- or retro-duodenal approach seemed unavoidable Before this procedure was undertaken, it was suggested that a ball ended needle that we have used for injecting varicose veins might be more effective than either sounds or forceps The needle was accordingly boiled up It was passed down the duct as far as the obstruction, and a 20 c cm Record syringe, which had been filled with saline, was attached Fairly forcible injections were then made at intervals while the ball end was manipulated into different positions, under the additional control of the thumb and index finger of the right hand In this way the stone was successfully dislodged and pushed on into the alimentary canal, some smaller stones and debris were washed back and removed through the incision in the duct Patency was insured by passing the instrument into the duodenum

This manœuvre took only a short time and caused comparatively little trauma The method has subsequently been used in two smaller cases with equally satisfactory results It has also been effective in the more or less straightforward case for clearing the duct of biliary mud and soft stones A soft stone can be withdrawn quite easily by producing

suction with the syringe Success in removing an obstinate calculus by this method is probably due mainly to temporary uniform dilatation of the duct by hydrostatic pressure. It is possible that by this means resort to the trans- or retro-duodenal approach may often be avoided.

The needle used, which is made by Down Bros of London, was originally designed for injecting the distal varicose saphenous system from above and was later found an advantage in embolectomy (see *Lancet*, 1938, 1, 27, 723 and 786) It is 10 in long with a cannulated copper ball about 1/5 in in diameter at the distal end. It fits a standard Record syringe and is flexible to a certain extent, in virtue of its length. For biliary work the needle may have to be slightly bent towards the end.

MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SCIENTIFIC MEETINGS, JULY 26–28

SECTION OF NEUROLOGY AND PSYCHOLOGY

WITH Dr. R. DODS BROWN (Aberdeen) in the chair, this section discussed the

Significance of Auditory and Visual Hallucinations

Dr. P. K. MCCOWAN (Dumfries) said that formerly psychiatrists thought it important to differentiate clearly between hallucinations and illusions Today the two phenomena were considered so closely allied that their presence was of equal significance. In certain cases, however, it was essential to differentiate between them, and sometimes the prognosis depended on this successful differentiation. Hallucinations in the sane were met with in poets, philosophers and religious mystics, and perhaps in ecstatic moments such people recovered the clairvoyant powers formerly possessed by man. At one time man understood his relationship to nature and to his fellow men by a process of pictorial and visual intuition, whereas today he understood the relationship by observation, experience and thought There was thus in the process of civilisation a change in the mode of perception and man unfortunately had, through neglect, lost the former method of experiencing This explanation was more in keeping with the lives and work of these men of genius than the derogatory alternative that their unusual experiences were really manifestations of temporary madness Emphasis had now swung from the sensory to the subjective elements in hallucinations. Formerly it was held that the hallucination was a mental image so vivid that it was misinterpreted as a perception. Today the hallucination was regarded as a more-or-less ordinary image or thought, misinterpreted as a perception by the faulty judgment of the patient While such a theory seems to explain the phenomenon of the acute hallucination, it was not convincing in cases where consciousness was clear. Such patients do not regard their experiences as ordinary perceptions, but describe them in terms of things heard or seen, for want of more appropriate words. This was well illustrated by Mayer-Gross's case in Bumke's handbook. Morel furnished experimental evidence in his audiometer investigations in finding that patients were unable to compare the pitch and intensity of their "voices" with the sounds of the audiometer

Dr. MACDONALD CRITCHLEY (London) said that various neurological conditions, for example brain tumour, migraine, epilepsy and narcolepsy, could cause hallucinations. Hallucinations sometimes occurred in the sane—mass hallucinations, viridical and telepathic dreams. Kavanthy in "A Journey round my Skull" referred to the hallucinatory noises which occurred during the early development of a cerebellar hæmangioblastoma. Stransky's symptom of *Gedankenhoren* occurred in temporal lesions and optical allo-æsthesia in occipital lobe lesions But it was unwise to lean too heavily upon the occurrence and nature of hallucinations in localising intracranial lesions for they may be provoked by compression of cerebral arteries against the edge of the tentorium, or simple internal hydrocephalus "Peduncular hallucinosis" of Lhermitte (a syndrome of mild confusion and lilliputian hallucinations) occurred most often in pituitary or juxtapituitary tumours. In drug intoxications a distinction should be made between acute delirium after poisoning from a single massive dose and states of chronic intoxication. Bromide intoxication produced hallucinations of hearing and sight and sometimes the latter had a lilliputian character. Cannabis indica produced hilarious intoxication followed by vivid hallucinations as Gautier and Baudelaire described in powerful language D. H. Lawrence's beautiful account of the hallucinations produced by mescal and De Quincey's description of opium visions were well worth reading

Prof. HUGH CAIRNS (Oxford) said that in a series of 800 cases of verified intracranial tumour about 100 had experienced visual hallucinations From a study of this series it was apparent that hallucinations in their crudest forms consisted of flashes of colour or white light without form or shape More often the vision had definite shape and movement, usually away from the patient More complex hallucinations related always to past experience; it is the diplomat who served in Japan and not the cook from Whitechapel who sees the Japanese warrior in tortoiseshell armour. But the ideas behind the hallucinations were simple and crude—pictures almost without a story In no sane patient were they endowed with a purpose, as in the psychoses. With the hallucinations or independent of them, there were sometimes distortions of vision—for example, lilliputian hallucinations. Visual hallucinations were not linked with visual defects and earlier writers such as Henschen and Horrax, laid too much stress on the position of visions More important were the phenomena accompanying them. Hallucinations were usually short-lived but sometimes they had the deliberate quality of migrainous images In a few cases of the series the diagnosis was made more difficult by the presence of visions Hallucinations as presenting symptoms, seemed to be especially characteristic of tumours of the occipital, parietal or temporal lobe In two cases hallucinations occurred during ventriculography. From a study of this series it could be concluded that visual hallucinations could be produced by lesions involving any part of the cerebral cortex, optic nerves and chiasma and probably optic thalamus. This was understandable because of the elaborate nervous mechanism necessary for vision, and its correlation with other sensory impressions, and with space and movement Visual hallucinations were as perfect a physiological expe-

ment as any that we were able to devise or understand Electrical stimulation or excision of parts of the cortex were crude methods of revealing the activity of the cortex It was only by the evidence of visual hallucinations that we were able to get any indication of the visual functions of the frontal lobes

Dr W S MACLAY (London) said that knowledge of hallucinations had depended mainly on verbal descriptions by patients of their experiences Such description was not always satisfactory and could contain fallacies Graphic representation provided additional information which might be more reliable and more objective In work on the drawings of schizophrenic patients, it had been found that the scope of the investigation was apt to be limited by the patient's ability to draw Some artists were found who volunteered to take enough mescalin to cause hallucinations They then made sketches during and after the intoxication Such pictures showed the typical mescalin patterns, ability to see structures at the back of the eye, photopsia, repetitive appearance of visual phenomena, wave like distortion of vision, and a tendency of things to elongate themselves In the series the elaboration which changes elementary visual sensations into hallucinations could be demonstrated In the earlier pictures the repetitive phenomena could be explained in purely physiological terms, but in the later ones more and more additional features appeared which could only be accounted for in psychological terms The comprehensible contents were in fact superimposed on the physiological phenomena which interfere with the definition of the visual perceptions Both physiological and psychological considerations must be taken into account

Dr G W B JAMES (London) thought Dr McCowan's suggestion that hallucinations were a reversion to a more primitive type of thought an important one, and instanced the cinema and modern art as examples of such a trend Lilliputian hallucinations were in his experience rare He had seen only six cases in eighteen years' practice and all occurred in alcoholic, renal or senile cases He thought that they were of grave prognostic significance especially in senile patients

Dr E J C HEWITT (Shenley) drew attention to the importance of bromide intoxication, which tended to produce confusion and hallucinations The blood-bromide should be estimated in all cases having bromide for any length of time He had never encountered lilliputian hallucinations

Dr K W TODD (Gold Coast) asked whether telepathy had been sufficiently studied in its relation to hallucinations Intuition would also repay scientific investigation

Dr RICHARD LAGER (Exeter) quoted a case of a woman admitted to his hospital as an epileptic, who saw everything upside down and wrote words backwards Investigation showed that this was a functional condition and not epilepsy and she made a complete recovery

Dr D BLAIR (Edinburgh) said that he had frequently been consulted about patients who were hallucinated as a result of an intense interest in spiritualism or religious thought He quoted a case of this type which recovered on rest in the country Dr Critchley's and Professor Cairns's references to hallucinations in cases of intracranial tumour interested him for he had had a case which began with a hallucination of smell and later showed typical signs and symptoms of suprapituitary tumour

Dr D ROSS (Aberdeen) pointed out that lilliputian hallucinations were not always pleasurable and quoted a case of a woman who saw a minute news reel of her husband being murdered

Dr D R MACCALMAN (Aberdeen) referred to hallucinations in cardiac disorder which, in his experience, were usually of horrifying scenes or of large furry animals floating through the air Hallucinations of hearing of the tinnitus type were most distressing to the patient Professor Cairns had quoted a case in which cutting of the optic tract cured crude hallucinations of sight and yet cutting of the eighth nerve did not alleviate tinnitus Many hallucinations were defensive, this was well illustrated by Dr McCowan's patient whose hallucinations kept her from screaming He wondered whether patients who had hallucinations of organic origin had better insight than did psychotic patients

Dr MCCOWAN, replying, said that hallucinations in the sane were of an entirely different character from hallucinations in the psychotic, the regression theory did not necessarily explain psychotic hallucinations One of his cases had pleasant lilliputian hallucinations, but he was unable to assess their significance because the patient would not discuss them

SECTION OF OPHTHALMOLOGY

AFTER Mr W CLARK SOUTER, the president, had reminded the section that it last met in Aberdeen in July, 1914, a discussion was held on

Ophthalmic Services to the Civilian Population in National Emergency

Colonel ARCHER IRVINE-FORTESCUE (Aberdeen) began by giving a dramatic description of his experiences in Belgium twenty two years ago when the resources of his unit were disorganised by the sudden arrival of some 2000 men blinded by mustard gas, at a hospital equipped for only a few hundred cases He spoke of the dismay and difficulty of the situation, made worse by ignorance of the effects of mustard gas at that time Rough and ready methods had to be resorted to and he urged the meeting to consider the horrors of unpreparedness He then passed on to consider the effects of air raids apart from gas on the civil population Lessons could be learnt from the war in Spain and he deplored the "ex cathedra punditry" which had allowed no unofficial reports from Spain to be considered and discussed Two extremely useful books—namely, "Air Raid" and "A R P Lessons from Barcelona"—already existed and he recommended their study They emphasised the suddenness and completeness of the disorganisation that could be caused by high explosives He thought all ophthalmologists should press for the formation of corps of consultants and for uniformity of procedure, since at the moment the matter appeared to be in the hands of some two hundred separate local authorities, mostly at loggerheads He went on to discuss treatment and the equipment of mobile travelling ophthalmic units

Mr ARNOLD SORSBY (London) cited the motto of Marischal College, Aberdeen, "They say What say they? Let them say," which he interpreted as the utterance of defiance or despair. In his case it represented despair He considered the problem from the two angles of modern warfare—namely, *Blitzkrieg* and terrorisation of the civil population At a rough calculation he estimated the probable casualties in London alone in the first fortnight of a war as 340,000 From 40 to 50 per cent would be fatal, but this left us with a colossal problem He did not think the danger of gas so great as that of high

explosive by which multiple major injuries were caused, the eye injury being only part of the picture. He dealt briefly with treatment and recommended evacuation of the civil population and organisation of base hospitals.

Prof. A. J. BALLANTYNE (Glasgow) spoke of the necessary organisation and the need for better instruction of first-aid workers in irrigating and examining eyes. He pointed out that in Spain the first-aid posts had been abolished finally, and all cases taken direct to hospitals. He dealt with the possibility of every doctor carrying certain equipment in his car and thus becoming a mobile unit constantly ready.

Mr. W. J. B. RIDDELL (Glasgow) referred to the use of cocaine and other corneal anæsthetics as a temporary preliminary treatment, to allow of evacuation of numbers of people temporarily blinded by gas

This opened a lively discussion on the merits and demerits of treatment by vasoconstrictors and local anæsthetics. It brought out the need for further knowledge in view of the evolution of a new group of vasoconstrictors since the war The opinion of the meeting was about equally divided between the view that cocaine was of value in alleviating symptoms and should therefore be used and the view that it damaged the corneal epithelium and led to ulceration. Colonel Irvine-Fortescue upheld the latter opinion very strongly. As regards the action of the ephedrine group of drugs it was felt that insufficient knowledge was available for a definite ruling.

Convergence Deficiency

Miss IDA MANN (London) showed by an analysis of 6400 case-sheets that convergence deficiency appeared to be responsible for the symptoms in roughly 2 per cent of cases in private practice. It bore no relationship to age or error of refraction, though it was often associated with a neurotic or unstable history. This was not always the case, however, and by an appeal to Gordon Holmes's work on the cerebral integration of ocular movements she had attempted to explain the anatomical and physiological basis of the condition The treatment, which was very promising, 69 out of 71 cases treated showing cure or improvement, consisted in improving "facilitation" of the cerebral pathways concerned by re-educative exercises designed to increase the range of voluntary convergence and the efficiency of stereopsis at the near point. The orthoptic exercises employed aimed in the first place at dealing with retinal neglect in cases with a strong master eye, by means of Wells's charts; this was followed by exercises in the voluntary production of physiological diplopia by convergence; and finally the patient was taught to fuse stereoscopic pictures by convergence without the use of a stereoscope In this way full voluntary control of the extrinsic muscles and of accommodation could often be obtained and the symptoms disappeared.

Mr. O. GAYER MORGAN (London) referred to cases from his own experience bearing out these theories Mr MYLES BICKERTON spoke about the convergence amplitude required by the Royal Air Force, and Professor BALLANTYNE pointed out some important factors in testing for the condition.

Chemotherapy in Ophthalmology

Mr. FREDERICK RIDLEY (London) said that today chemotherapy was held to be almost synonymous with treatment by one of the sulphonamide group of drugs, but actually it had a much wider meaning than this. It should be defined as the use of an antibacterial substance capable of destroying o. inhibiting bacteria in the tissues or on the surface of the body in a concentration harmless to the tissues. It therefore differed from shock or immunisation therapy and one must consider its effect on the natural defences of the body. If it lowered or destroyed these it was harmful; for example, eusol was an excellent bactericide but it also destroyed and inhibited the formation of lysozyme and therefore should never be applied to the conjunctiva He then proceeded to deal with the various groups of drugs used as local applications in ophthalmology—salts of heavy metals, and antiseptics such as acriflavine and mercurochrome—and the action of the sulphonamide group either for local or general use Among these last he had a slight preference for M & B 693. He described some hopeful cases in which both pneumococcal and gonococcal conjunctivitis had cleared up with remarkable rapidity after administration of sulphonamides in the usual dosage It seemed important, however, to start the drug just at the point where the patient's own immunity was beginning to come into play, for it would then act synergically and the maximum effect would be obtained Of the chemotherapy of trachoma it was not yet possible to speak dogmatically.

Mr. GAYER MORGAN proposed a new ætiological classification of traumatic myopia, according to whether it is traceable to (1) spasm (ciliary muscle and sphincter papillæ); (2) partial rupture of the zonule; (3) changes in the lens; or (4) serious damage to the coats of the eye causing axial lengthening

Mr. COLE MARSHALL read a paper and showed a film on the treatment of retinal detachment The PRESIDENT showed films of operations made by Professor Weve of Utrecht and Mr. H. B Stallard

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SECTION OF ORTHOPÆDICS AND FRACTURES

Mr ALEXANDER MITCHELL (Aberdeen) was in the chair for a discussion on

Delayed Union and Non-Union of Fractures

Mr R I STIRLING (Edinburgh) said that in normal healing of long bones the deposition of calcium and other salts was due to the action of phosphatase on the monophosphatic esters at an optimum pH of 8 4. Fluid aspirated was at first mainly blood at pH 7·4; at later aspirations it became more acid (pH 4 7 on the fourth day), later it swung over to alkalinity, up to 8 2 or more At this stage phosphatase was active. Calcium in the hæmatoma fluid was 10–20 times the normal blood figure Experiments in vitro showed that a hypercalcæmic fluid stimulated bone cells The causes of non-union were manifold First were gross separation of the fragments and interposition of periosteum or soft tissues between the fragments, which might lead to pseudarthrosis Interposed tissues must be removed. Lack of immobilisation caused repeated rupture of blood-vessels and so interfered with the chemistry of the hæmatoma fluid. Damage to the nutrient artery delayed union, for the collateral circulation was not fully established under 3 weeks; in such cases longer immobilisation was needed. If this precaution was ignored non-union resulted, especially in fractures of the mid-shaft of the humerus. Gross damage to vessels and nerves of the limb led to failure of mesoblastic tissue formation and so delayed union. Repair might cease through inadequacy of blood content. Vitamins A and B were normally deficient in the hæmatoma fluid, but if vitamin C was deficient there was

abundant callus formation with delayed union Vitamin C should therefore be given early even when there was no deficiency, as was practised by Hertz of Copenhagen In diabetes and hypothyroidism union might be accelerated by administration of the deficient hormone but glandular extracts in ordinary cases were of no proved value In compound fractures a Vaseline pack could supply the missing bone factory wall Injudicious operations and use of metal plates sometimes delayed union Experiments in vitro showed that calcium was not absorbed in the presence of metal Even stainless steel was no advantage Sepsis was a very potent cause of non union But the vast majority of examples of non union were due to inaccurate anatomical reduction or to inadequate immobilisation

The CHAIRMAN interpolated an account of a young man who 6 months after a plating operation in a fractured femur fell, broke the plate and was found to have no union whatsoever at the fracture site

Mr NAUGHTON DUNN (Birmingham) said investigation of the cause of non union was an essential preliminary to operation Syphilis must be excluded or treated In compound fractures the nature of the original infection should be ascertained Hendry in 1936 found 9 cases of delayed gas gangrene as the cause of non union In Henderson's 211 cases of non union at the Mayo Clinic, 66 per cent had been plated At Guy's Hospital between 1911 and 1914, 457 cases had Lane's plates applied In 1934, only in 6 cases was this done This was surely conclusive evidence against the method One must always ask if union would improve function Sometimes any operation would be harmful Sometimes osteotomy or removal of fragments might be the procedure of choice Where an appreciable gap occurred in ununited fractures of long bones, this could only be successfully bridged by an autogenous bone graft In a case of fracture and effusion into the lower radio ulnar joint with abolition of pronation and supination, removal of a piece of the lower third of the *ulna restored* the movement A postman who walked 18 miles a day without inconvenience on the shortened leg had an ununited fracture with extreme deformity of the tibia and fibula at the lower end Operation would here have been unwise In fracture of the patella and internal malleolus removal of a fragment restored continuity and function For non union with fragments in contact for example flail shoulder or elbow, Mr Dunn described an operation which had been successful in 22 consecutive cases The principle was to utilise *living bone grafts* to surround the fracture at the site of non union The bone ends were exposed and freshened and, when necessary, subcortical grafts were inserted around the fragments In non union of the tibia following osteomyelitis, transposition of the fibula resulted in reduction of shortening and restoration of stability Success had attended transposition of the fibula in two cases of congenital non union of the tibia

Dr PHILIP D WILSON (New York) criticised sweeping condemnation of plating Lane's plates were disastrous, the studies of Venable and Stuck had shown that the presence of metal gave rise to electrolytic action with calcium and other salts and delay resulted But if Vitallium a cobalt chromium alloy was used this did not occur Operation was not often necessary but when it was done it should be done early and confident fixation effected Dr Wilson preferred living grafts fixed by vitallium screws The fibula was the best graft in cases of pseudarthrosis Often the fibula itself united after the graft from it had taken in the tibia This might be due to efficient immobilisation

Mr ALAN TODD (London) rebutted the argument against Lane's plates by pointing out that in the period quoted by Mr Dunn the no touch technique of Lane and Faggo was not being used Probably on account of jealousy, their successors refused to employ this method which had never been surpassed By 1934 these men had retired Mr Dunn should give the figures of the successes as well as the figures of non union Lane never plated compound fractures or cases of non-union except during a short period of the war He agreed with Hey Groves that excessive fixation was bad Steadying but not rigid fixation was better practice

Mr H O CLARKE (Manchester) asked Mr Stirling what was the best time for operation in a recent fracture Plating was not such an evil as Mr Dunn claimed In the Presbyterian Hospital, New York, by routine plating, they succeeded in returning their cases to work more quickly than we could In congenital pseudarthrosis of the tibia, grafts fixed by vitallium screws were his only successful cases

Mr SIR J D BUXTON (London) was not prepared to accept the view that the cause of non-union in fractures of the mid-shaft of the humerus was injury of the nutrient artery This was not the only factor, for delayed or non union did not follow ligature of the main vessel in an experimental fracture Grafts must be made firm, by whatever means, though he had discarded the use of metal He thought that the skeletal traction of a Thomas splint could cause non union

Mr STIRLING, in reply, said the best time for operation, after every conservative method had been tried, was about 10 days after the injury Then the collateral circulation was well established and embryonic tissue was proliferating Massive crystallisation was a condition which often occurred in fractures of the shaft of the femur, when in elevation in the presence of abundance of vitamins and minerals *union was not firm On lowering the limb to the bed* the fragments joined securely within 24 hours Mr NAUGHTON DUNN was not to be persuaded that there was any good in a Lane's plate He had never used one and had seen many disasters following their use by others

Open Fractures

Mr W C GISSANE (London) said he would describe his treatment of the open fractures occurring in a *large city, for the most part from road accidents* There were blessings to be counted in the conditions of injury The roads of a city were clean and often tarred, clothes were usually surgically clean—that is, they were free from pathogenic organisms, the instrument causing the injury was a shiny, petrol-driven vehicle, transport to hospital was speedy In this way three dangers were avoided delay, contamination from clothes, and contamination from the street dirt All clothing was submitted to aerobic and anaerobic culture A large number of non-virulent organisms was found In the last hundred cases only one showed gas gangrene and none tetanus The usual pathogenic organisms were those found on the skin The first step was excision of injured tissues, the living tissue left behind was able to cope with the remaining organisms The next step was administration of anti tetanus and anti gas-gangrene serum In a series of a hundred consecutive cases the sites of fractures were as follows tibia and fibula 43, skull, 11, radius and ulna, 7, phalanges 6, multiple long bones, 5, femur, 5,

mandible, 5, nasal bones, 5; ankle, 5; humerus, 3; metacarpals, metatarsals, pelvis, malar and superior maxilla together, 6. There were 82 males and 18 females: 76 cases occurred between the ages of 5 and 45 years. Cases came in after first-aid treatment had been applied and the fracture immobilised. Shock was present The first principle was to disturb the patient as little as possible. Shock was treated with rest, heat and a large dose of morphia. The patient was not washed, the splint was not interfered with and intravenous saline was not given. The wound was covered, the temporary splint was left intact and treatment begun within an hour. The main thing was to render the injury painless, for example by local anæsthetic. Before operation no washing or shaving was done, the skin was covered with spirit-soaked gauze and the wound uncovered. Mr. Gissane's faith in excision of wounded tissues and removal of dirt and tissue debris had superseded his faith in antiseptics. Leriche had said that the large-scale experiment of 1914–18 had demonstrated the failure of antiseptics. What was important was the vital quality of the tissues remaining. Often there was tearing of the skin and subcutaneous tissue to form a flap from the ankle to the popliteal space. It was best to sacrifice the flap and repair the area with immediate grafts. In ten such cases in a year, where previously amputation would have been performed, complete recovery had taken place Fractures into joints might occur or open fractures with deep wounds. In both such, the treatment was excision and washing out with gallons of isotonic saline. Bone must be treated more gently. Débridement was confined to gentle elevation and the minimum of manipulation. After reduction by apposition and traction the wound was closed by a split skin graft. After closure, traction was maintained, the wound was cleansed by surgical spirit and immobilisation was insured by plaster-of-paris and the double-transfixion-pin technique After débridement the soft tissues received blood but the return circulation was not completely established. Thus the tissues would not die on account of anæmia, but œdema always occurred. To prevent it, it was necessary to apply pressure This was most evenly done by a wool-and-paraffin dressing. The first plaster was kept on for 4 or 5 weeks if the temperature or pulse charts gave no indication for removing it. Then the plaster was changed and a closed healing fracture was usually present

Treatment was summarised in seven stages: shock; direct surgery without antiseptics; gentle reduction of the fracture; closure by skin graft or closely applied interrupted sutures, application of a soft paraffin dressing; immobilisation by plaster for 4 to 5 weeks; rest for 4 to 5 weeks

Mr. G. H. STEVENSON (Glasgow) said that in first-aid the first dressing should be very large. First-aid splinting was often well done but too localised. It was a good rule to immobilise the joint above and the joint below the injury. He often had to cope with the long delay after fracture caused by air-transport from the Hebrides. Unlike Mr Gissane he did not interfere with the usual washing and cleansing. He preferred a general anæsthetic to a local one, gas and oxygen or cyclopropane and oxygen for choice He had not found that the experimental results of spinal anæsthesia of O'Shaughnessy and Slome were always proved in practice He cleansed and shaved the skin, cleansed the wound with weak flavine or Dettol and then proceeded to débridement. He did not believe it was possible to excise the whole of the torn area. For closure of the wound he believed in Rutherford Morison's preparation "bipped silk," and the stitches should include skin and subcutaneous fascia only The Thomas splint as often as not was used for applying traction. A useful sling for the limb could be made by splitting the inner tube of a motor tyre lengthwise; the calf of the leg rested nicely in the curve of the tube. In multiple open fractures it might be better to sacrifice the limb rather than the life.

Mr. ZACHARY COPE (London) said asepsis was not always the best kind of surgery in open injuries. In cases which came from a distance, the type of wound must decide the type of surgery. In a bullet wound when penetration was from without inwards, the organisms present came from outside; antiseptics alone would then be of no use In a fracture, when penetration was from within outwards, no organisms would be present. Lister had shown that antiseptics were then of value in preventing infection. Débridement of course could be employed here to deal with the damaged tissue.

Mr. E. T. C MILLIGAN (London) said he was greatly encouraged by Mr. Gissane's fresh exposition of the excision technique. During the war spinal anæsthesia was prohibited for the treatment of shock. It was of most use in cases where much fluid had not been lost. The blood-pressure was then used as an index In those days, a pressure of under 120 was a contra-indication to spinal anæsthesia, but nowadays it was employed if the pressure was as low as 90. Most of the credit given either to asepsis or antisepsis was due to the excision of wounds carried out at the same time.

Mr. A. H. MCINDOE (London) said that coöperation between the surgeon and plastic-surgeon was to be desired, for not everyone could cut as large a graft as Mr. Gissane Special centres for grafting and other plastic operations would be necessary during an emergency.

Mr. R I. STIRLING (Edinburgh) said that the old method of débridement could be modified in severe wounds by swabbing with 1 per cent crystal-violet and brilliant-green. Devitalised tissue showed up black and healthy tissue blue and thus selective excision could be done.

Dr. P D. WILSON (New York) felt that there was always a danger in suturing compound wounds, for although culture in the first few hours might be sterile, organisms might develop later. He seldom had confidence to close them. The experience of surgeons engaged in the Spanish war and in China led them to favour Winnett Orr's method of treatment. This consisted of excision, application of a paraffin pack and immobilisation in plaster for a long period. Extension of military surgery must be founded on civil experience and he was sure that in an emergency we should be forced to leave wounds open. Traction splints were used by all the emergency services in America and therefore most of the fractures arrived in hospital in these splints, in much better condition than previously, and less shock was present

Mr. GISSANE, replying, said that he had a team three strong to deal with multiple fractures and they did pretty radical excision. He had had to rediscover the value of leaving viable tissue, and then had discarded the use of antiseptics Some antiseptics were actually injurious. Wounds to be skin-grafted could be left open after excision of devitalised skin, covered in plaster for 4 to 5 weeks, and then a skin graft was applied over the muscle after clearing away the granulations.

SECTIONS OF ANATOMY AND ANTHROPOLOGY

Prof. ALEXANDER LOW (Aberdeen) was in the chair when Prof H A HARRIS (Cambridge) opened a discussion on

Anatomy and Physical Training

During growth, he said, particular attention must be paid to the spine, whereas at any joint there is not only bone but also articular cartilage, epiphysial growth cartilage and calcified cartilage, here in addition there are the complex intervertebral disks with their own physical properties and rates of growth In man there is more growth in the lumbar region that in the cervical or thoracic spine, and in the lumbar region the disks are thickest and the spine most freely movable Mobility of the spine is a property of the disks, in which the nucleus pulposus, set in a fibrous shock absorbing ring, exercises a ball bearing function The main differences between the spines of men and quadrupeds are the overgrowths of the disks and lumbar spine (both vertebræ and disks) and the substitution of thin annular epiphyses for the truly "epiphysial" plates of other animals These washer like rings begin to ossify about puberty, so that then there is a change in the physical properties of the vertebral column At this age, therefore, the liability of injury to the disks is greater in severe bending exercises, such as touching the toes The rough-and tumble of ball games is therefore less dangerous than squad drill The frequency with which a disk is injured varies with its thickness Similar principles should be applied to the limbs Union of the epiphyses at the shoulder should alone determine the time at which heavy manual labour is started Disease and deformity are quite as liable to occur in the hip bone as in the head of the femur

It was folly to cast horoscopes on the basis of imaginary relations between physical development, mental development, temperament and susceptibility to particular diseases There was a low correlation between intelligence and physical efficiency While no two children progressed towards maturity at the same pace, yet natural forces had a way of reducing the differences to some extent as maturity was approached A distinction must be drawn between posture and attitude Posture is a nervous mechanism of ancient heritage, modified in man by the acquirement of stereoscopic vision, and dominated by the righting reflexes, which are physiological and developed at an early age Posture is automatic and involves the minimum of mental and physical fatigue Attitude, on the other hand, is a position of preparation for action and consequently places a considerable strain on the individual. Much of physical drill is directed towards the acquirement of an attitude rather than the maintenance of a pose In assessing posture it must be remembered that military smartness has no anatomical or physiological basis and that physical training is not regimentation It is impossible and unnecessary to make all children conform to a standard developmental pattern or a standard of physical performance in terms of age, whether that age is calculated by the calendar or by mental tests Above all, physical training should not attempt to interfere with the body build Food, play and free unorganised games in early childhood are the basis of healthy growth and physical training There is no index of physical fitness or efficiency save the ability to do one's job and live to a ripe old age The establishment of a false index will only produce inferiority complexes

Dr E SOLLY (Harrogate) opened the discussion which followed Prof D J WATERSTON (St Andrews) pointed out that though a man may carry out an action satisfactorily, still he may not do it in the best possible way, we should not lose sight of the fact that the best way can be taught. Many people, slouching about the streets, could do with a lesson in deportment

Prof R D LOCKHART (Aberdeen) questioned whether those responsible for physical training are so much in the dark about the dangers of regimentation and of certain exercises Muscles were very important, the tension of the hamstrings imposes restrictions on the combined movements of the hip- and knee joints, within any restriction imposed by the actual structure of the joints

Professor HARRIS, in reply, admitted the psychological effect of any form of training, but believed that the carriage of most people was satisfactory, and that slovenly dress must not be mistaken for bad posture There was a great discrepancy between physical build and physical prowess

Dr J K SLATER (Edinburgh) discussed the

FITNESS OF THE STUDENT

By a voluntary scheme, he said, all students at Edinburgh University could be medically examined, the numbers presenting themselves for examination and re examination had steadily increased as the students appreciated the benefits of the scheme It was very difficult to establish a standard when there was no specific object to be attained by that standard, in contradistinction to the insurance companies' standards of health Among the students he had divided posture into three grades, of which the third —bad—included all definite deformities On the whole posture was good, but there was a remarkable prevalence of flat feet It seemed probable that the likeliest way of establishing a life prognosis would be found in the investigation of the circulatory system

Professor HARRIS said he would like to see X ray examinations carried out on all students, and suggested that the incidence of pulmonary tuberculosis was very high in medical students The results should be followed up after the students had left the university Professor LOW and Mr G A G MITCHELL (Aberdeen) queried the prevalence of tuberculosis in medical students at Aberdeen

In reply Dr SLATER stated that the commonest causes of ill health among students were, in order, pulmonary tuberculosis, venereal disease, and gastric complaints A diploma of physical education was now given at Edinburgh and was open to all students

Professor LOCKHART showed a cinematograph film he had taken at the Bergman Österberg physical training college, Dartford A series of exercises was performed by an expert and a learner and the differences pointed out Special attention was drawn to one in which the arms were elevated without movement of the clavicle The trained student could achieve this, but not the learner, who could not allow her muscles to relax sufficiently

Prof A. Low then spoke on

GROWTH OF ABERDEEN INFANTS

At the Aberdeen Maternity Hospital, he said, 1000 infants had been examined and then re examined at the child welfare centre Of 50 male and 50 female children who were fit, normal, and full time, the boys at birth averaged in height 19·7 in and in weight 7·7 lb, while the girls were a fifth of an inch and a tenth of a pound less These heights were less

than the figures generally given, but the weights were five to six ounces greater than the published figures for other towns Re-examination showed that the girls grew slightly faster than the boys and that in two to three years the figures are comparable for both sexes; by five the girls were slightly taller. For both sexes the figures were now higher than those for the five-year-olds of Dundee and Edinburgh. The pre-school years were very important. The working-class mothers of Aberdeen had shown great intelligence and appreciation of the work. There was urgent need in this country of reliable observations on the growth of the child, as there was an entire absence of continuous figures on the development of individual children. We had no reliable British growth statistics

Professor HARRIS agreed about the serious gaps and considered the expenditure on school medical services unremunerative because of the loss at the two ends Records should also be kept of the development of teeth, and of defects in sight and hearing. We knew more of the continuity of development of a laboratory rat than of a human being.

Professor LOCKHART, who had taken the chair, said that he believed that this was the first time in any country that such figures had become available, and, in reply, Dr LOW remarked on the appearance of two developmental types, a precocious type which developed rapidly but by fits and starts, and a slower but more steady type These resulted in two kinds of infant face, one long, "like his father," the other chubbier, "like his mother."

REVIEWS AND NOTICES OF BOOKS

Fractures and Dislocations in General Practice

Lewis's General Practice Series. By JOHN B. HOSFORD, M.S. Lond., F.R.C.S., assistant surgeon to St. Bartholomew's Hospital. London: H. K. Lewis and Co. 1939. Pp. 274. 12*s.* 6*d.*

Experience in the Management of Fractures and Dislocations

By the Staff of the Fracture Service, Massachusetts General Hospital, Boston. General editor, PHILIP D. WILSON, clinical professor of orthopædic surgery, Columbia University. London: J. B. Lippincott Company. 1938. Pp. 1036. 65*s.*

A Manual of Fractures and Dislocations

By BARBARA BARTLETT STIMSON, A B, M.D., Med.Sc.D., F.A.C.S., associate in the College of Physicians and Surgeons, Columbia University, New York City. London: Henry Kimpton. 1939. Pp. 214. 12*s.* 6*d.*

BOOKS on the treatment of fractures follow one another so rapidly that one is left wondering whether most of them attain any but a purely local public. No branch of surgery in recent years has given rise to greater enthusiasm in those who practise it. At the present time many doctors are asking to be taught about the treatment of injuries who, until warnings of crisis and emergency disturbed them, had thought not to be drawn into traumatic surgery Mr. Hosford's should be an excellent textbook for them It is very well-balanced, containing detailed information about all the common fractures and dislocations but omitting descriptions of operations and rarer injuries which concern only the orthopædic specialist. The application of plaster splints has a chapter to itself, and it is probable that no better account can be read anywhere. The methods advocated for the various fractures are, of course, those used by the author. They are clearly set out and convincingly explained This is the first textbook, to our knowledge, which has described clearly the four methods of using the Thomas splint for continuous traction. Skeleton splints, rather than plaster-of-paris, are recommended for the treatment of compound fractures, until a stage when the wounds have either healed or shown evidence of obvious infection. For infected fractures, the Winnett Orr technique is described.

The volume produced by the surgeons of the Massachusetts General Hospital is primarily an account of their own experience in fracture treatment. It is a complete clinical and statistical account of 4390 fractures and dislocations, good results and bad being impartially related. At the end of each section on any type of injury, methods and results are criticised. Each section is written by a different surgeon, and as there are thirty-four sections in all, one cannot but be impressed by the wealth of surgical personnel which the fracture practice of the hospital commands. The book is very interesting to the specialist, but it is not of value to the seeker after first principles or solutions of individual problems It contains much useful and practical information, but surgeons as a rule do not like the statistical approach. Open treatment of compound fractures is advocated, by the Carrel-Dakin method. No case of gas-gangrene is recorded, although anti-gas-gangrene serum was not used at all. Dr. Charles Scudder makes a strong plea for more frequent use of open operative methods, especially in the case of long bones. In head injuries he says the tendency should be to operate less. The text is uneven in quality

Dr. Stimson's manual is intended for medical students. The correct and incorrect ways of taking the history of an injury are described, and throughout the text and the illustrations are designed to appeal to the beginner. The summary given of the points of importance in each fracture is an aid to memory, as is also the description of each injury under uniform headings—occurrence, displacement, diagnosis, pathology, treatment, period of immobilisation and prognosis. This is a less ambitious book than either of the other two, but useful for the reader who still has to face a qualifying examination. The illustrations are throughout line-drawings, which in most cases seem unnecessarily heavy and rather inelegant There is something in Mr. Hosford's contention that, since one has in practice to interpret not diagrams but original skiagrams, these are more suitable as illustrations for textbooks on fractures

A Textbook of Surgery

By American Authors. (2nd ed.) Edited by FREDERICK CHRISTOPHER, B.S, M.D., F.A.C.S., associate professor of surgery at Northwestern University medical school; chief surgeon, Evanston (Illinois) Hospital. London: W. B. Saunders Company. 1939. Pp. 1695. 42*s.*

IN this textbook of surgery collaboration has been brought to its highest pitch, in that 183 living and 4 dead authors have contributed to its pages Included in these are the best-known names in American surgery, and each subject is dealt with by an acknowledged master. The balance of the book however has been perfectly preserved, and its editor deserves the highest praise for the way in which proportion

has been maintained between the various subjects He has driven such a distinguished and no doubt high spirited team with the greatest skill The result is a *textbook which is authoritative, completely* up to date, and the result of observation and experience, rather than of quotation or impression

It is difficult to pick out the best in this book; perhaps the chapter on the nervous system, particularly the sections on tumours of the brain by Max M Peet and on head injuries by Carl Wheeler Rand, stands out Fractures are admirably dealt with, as are the various aspects of abdominal surgery In the genito-urinary section, prostatic enlargement receives poor attention, and while the American preference for perineal prostatectomy is mentioned, *no description of either this operation or of any of* the suprapubic operations, is given Chest surgery, orthopædics, gynæcology, and plastic surgery are all given ample space It is pleasant to find such a wealth of material in excellent print, with a minimum of small type There are 1381 illustrations, well produced and apposite, but it seems curious that the chapter on diagnostic and therapeutic radiology in surgery by James T Case should be without illustrations

Dr Christopher has proved that multiple collaboration need not lead to prolixity, his contributors have shown that the expert is the best person to summarise his subject, and the publishers have given most satisfactory form to a book which is bound to achieve widespread and well deserved popularity

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Essential Nature and Organisation of Food Energy

By M BIRCHER-BENNER, M D London John Bale, Sons and Co 1939 Pp 80 5s

THE late Dr Bircher Benner made a considerable name for himself, even among orthodox physicians, by his dietetic treatment of various diseases, including tuberculosis, using uncooked fruits and vegetables exclusively The present book is an attempt to justify his principles by arguments from modern physics, modern biochemistry and the second law of thermodynamics, and the attempt seems hardly worth while The book might be reduced to the following statement uncooked and unaltered vegetable foods have more activated molecules than animal foods, these can emit quanta of energy which can be utilised by the animal eating them, cooking and passage through the tissues of animals reduces this available energy, therefore animal foods and cooked vegetable foods are less valuable in nutrition than raw and uncooked vegetable foods

The rest of the book contains little but dogmatic assertions, intricate assemblies of quotations from physicists from Carnot to Eddington and questionable deductions from these writers' works It will probably convince no one but the advocates of extreme vegetarianism, for it bears the stigmata of fanaticism The author himself writes —

"I foresee great *resistance and many refutations* to the new doctrine, which will be challenged also on account of *its novelty* To conceive food energy as systems of light quanta is revolutionary enough Still more unheard of is the conception of a specially schemed organisation of energy in every nutriment, which I termed food integral If I go so far as to assert that with food we introduce energy into our body corresponding to the body's structure which is adequately organised, or disorganised or transformed, some physiologists will immediately arise and explain that it is all nonsense, that in the process of resorption of food the digestive-fermentative action destroys the energy organisation."

The book will do little to remove or overcome *resistance to these doctrines* There are many mistranslations—quant and quants for quantum and quanta, catalyzators for catalysts, denaturalising for denaturing, and so on A far better monument to Dr Bircher-Benner's fame would be a collection of his case histories and methods of dietetic treatment, for his reputation can hardly have been raised upon such a sandy foundation as this book suggests

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Lumley's Public Health

(11th ed) By ERSKINE SIMES, M A., barrister-at-law of the Inner Temple, CHARLES D SCHOLEFIELD, barrister-at-law of the Middle Temple, and A N C SHELLEY, M.A, B C L, barrister-at-law of Lincoln's Inn London Butterworth and Co, and Shaw and Sons 1939 To be published in 4 vols, £10 10s Vol II Pp 2011

OVER a century ago a speaker in the House of Lords complained that Parliament had been passing statutes by wagon loads and repealing them by cart loads If we think in terms of lorry loads today, the simile is confirmed by the monumental tomes of the new edition of Lumley's Public Health The recently issued second volume, even bulkier than the first, to which we paid tribute two years ago, contains the acts on food and drugs (consolidated in 1938), housing, town planning, restriction of ribbon development, superannuation of employees, and rating and valuation, not to mention the drainage of trade premises, hydrogen cyanide fumigation, physical training and recreation, the various midwives acts, and certain parts of the Factories Act of 1937 The editors hope soon to issue the fourth volume of the new "Lumley," which will contain the appendices, the third may be delayed and may appear in two parts They confess that the contents of this third volume are not yet settled Nor is this surprising They want their work to be comprehensive and complete They may well feel inclined to wait and see if the consolidating and amending Water Undertakings Bill receives the royal assent in the autumn And by that time it may be possible to guess the prospects of certain other legislation about health now just appearing above the horizon The subscribers to this colossal 16 guinea edition must have faith in the wisdom of the editors For the first time for thirty years the name of Sir Joshua Scholefield, K C, is absent from the title page of a volume of "Lumley" His former colleagues carry on competently the difficult task of expounding, annotating and collating the various branches of public health law

It is not merely the lorry loads of statutes that matter There are also trailer loads of statutory rules and orders behind them The interdependence of act and order is illustrated by the familiar section 6 of the Midwives Act of 1936 which prohibits unqualified persons from acting as maternity nurses for gain Parliament does not like legislating ahead of the facts It therefore enacted that this restriction should not take effect in any area until the Minister of Health was satisfied that the local authority has first provided an adequate domiciliary service of midwives there The volume under review gives us the text of the section and some appropriate notes thereon but does not seem to give the terms or substance of the orders whereby the Minister has pressed the button for the operation of the section in say, Birmingham or Somerset Perhaps this information is reserved for a future appendix Then again the

restriction in section 6 is not to apply to women certified by certain hospitals and other institutions to have been trained in obstetric nursing. The hospitals and institutions are those which the Minister names. A footnote by the editors refers to two orders, one of 1937 and another of 1938, whereby the Minister has specified certain hospitals and institutions But the book went to press presumably too soon to include a reference to a second order of 1938 to the like effect, not to mention the three subsequent orders of 1939. To single out so small a point in so vast a publication is not to criticise the editors' work so much as to exemplify its difficulties The new "Lumley" maintains the standard of its predecessors. No more need be said.

Diet and Ill-Health on the Gold Coast

Especially in its Forest Country. By F. M. PURCELL, M.D. Dubl., M.R.C.P.I., D.T.M., & H. Lond. London: H. K. Lewis and Co. 1939. Pp. 77. 7s. 6d.

THE author, a medical officer on the Gold Coast, having recognised the need for vision in dealing with ill health among the western Akim, has collected cases showing evidence of malnutrition. His book is divided into two sections. The first deals with the local dietary at Oda, the chief town, and in scattered villages in the forest areas, where the main industry is cocoa farming The second section describes cases of malnutrition and related diseases, mostly amongst the children of these communities Some tribes live on a staple diet of plantain, cocoyam and cassava, while those in the northern territories live mainly on millet and some meat On the coast, fish supplements the diet. The importance of nutritional œdema and skin disorders in the diagnosis of malnutrition is stressed, and cases are described showing many features of the pellagra syndrome. Reasons are given for thinking that *akwashiokar* is a form of infantile pellagra The interesting clinical material is well illustrated by numerous photographs. The author points out the difficulty of detecting subjective symptoms in primitive communities, for example the detection of impairment of vision among those who are illiterate. Such observations make his findings of value to those who deal with nutrition from a more academic standpoint The book is also of great importance for those who are faced with administrative problems of ill health on the Gold Coast, since excellent suggestions are given for improving the dietary; thus green leafy vegetables might be widely used, since these are within the limited means of these communities.

Abnormal Speech

By E. J. BOOME, M.B. Birm., M.R.C.P., D.P.H., principal assistant medical officer, London County Council; and H. M. S. BAINES and D. G. HARRIES, speech therapists for day centres and mental hospitals of the council. London: Methuen and Co. 1939. Pp. 162. 6s.

UNTIL recent years the importance of speech defect had been overlooked, but during and after the Great War it was shown that stammer could be produced by prolonged mental strain. Consequently speech defect as a symptom of similar strains in civilian life became widely recognised by physicians. It was then a short step for the educationists to realise that speech defect in children might be the result of similar nervous stresses, and that successful treatment of the stammering child, not only made it easier for the child to learn, but often resulted in the removal of other accompanying nervous symptoms There is now a rapidly growing speech-therapy organisation and several books on the results of this work have appeared in recent years. The volume under review is an interesting contribution to the subject and certain chapters can be specially commended, notably those on the difficult child, and the spoken word There is an amusing appendix, taken from an American official publication on "Data of Child Development" There are two slight defects in the book; the authors have attempted to put too much into a small volume, and it is a series of separate papers rather than a coördinated review of the whole subject This is a danger difficult to avoid when a number of writers have pooled their experiences The book is nevertheless interesting, not only for its contents, but also for its disclosure of the extent to which work under the London County Council has proceeded.

Aids to Dermatology and Venereal Disease

(2nd ed.) By ROBERT M. B. MACKENNA, M.D. Camb., M.R.C.P., hon. dermatologist, Royal Liverpool United Hospital. London: Baillière, Tindall and Cox. 1939. Pp. 284. 4s. 6d.

THIS little book is more than an aid to dermatology; it is a miniature reference book, more complete than most small handbooks on the subject All the common skin diseases are dealt with thoroughly and concisely and many rarer conditions are included Forty-four pages are devoted to a very adequate description of the venereal diseases and their treatment. Such recent advances as the use of M. & B. 693 for gonorrhœa and the complications arising from this drug are included in this section For its size the book is extremely readable, but of necessity there are no photographs. It can be strongly recommended to any practitioner who requires a small textbook on diseases of the skin.

Clinical Bacteriology

By F. A. KNOTT, M.D. Lond., M.R.C.P., D.P.H., director of the bacteriological department and lecturer in bacteriology, Guy's Hospital London J. and A. Churchill. 1939. Pp. 420. 12s. 6d.

IN this book an attempt has been made to present bacteriology in its application to clinical work Detailed descriptions of technique and cultural reactions of bacteria have, therefore, been cut down to a minimum. Nevertheless the clinical aspects are not more fully dealt with than in several other English textbooks of bacteriology, in spite of a short chapter on the management of infectious diseases and the mentioning of the clinical features of a few infections in the appropriate chapters. The presentation of the facts is simple, although in places the writing is rather confused as in the sections on the structure of antigens and the rate of antibody production. In two tables (pp 200 and 260) the data are at variance with the text. The statements on pp. 133 and 152 referring to the fermentation of inulin by bacteria of the streptococcus pneumococcus group are contradictory. *Clostridium chauvoei* is wrongly credited with the ætiological rôle in lamb dysentery and the author states that tularæmia is met with only in America whereas its occurrence in Asia and in several countries in Europe is well recognised. Most of the illustrations are adequate, a few, such as fig 20, are not particularly instructive and might well have been omitted.

THE LANCET

LONDON SATURDAY, AUGUST 19, 1939

FRACTURES A SPECIALTY

THE steady spread of specialisation in surgery is often deplored as a necessary evil necessary because the advancement of science has made surgery far too big a subject to be mastered by one man, evil because it limits the variety in a surgeon's work and sometimes warps his perspective To the patient, however, the word "specialist" signifies something not evil but good, and there is no doubt that specialisation in surgery almost always improves the patient's lot, which, after all, is what matters most The rival arguments have been revived by the appearance last week of the report on rehabilitation after fractures, which we summarise on p 446

Should fractures be treated by the general surgeon in the general wards and outpatient department, or should they be segregated and treated from start to finish in a special department by an expert controlling a team of trained assistants? From the point of view of the injured man there is no question which alternative is the better Under the old system any person sustaining a fracture serious enough for inpatient treatment is admitted under the surgeon who happens to be on duty at the time This surgeon may have no special interest in fractures and will probably not see the case until a day or two later The immediate treatment is probably undertaken by a registrar or house-surgeon and the patient then remains in the ward for a few weeks surrounded by the sick and perhaps the dying During this time the visiting surgeon sees him and maybe makes some suggestions for modifying the treatment In due course the man is discharged, probably to the massage department, where his treatment is taken up by someone who has never seen him before and who is entirely dependent on the house-surgeon's notes for information Finally, when the patient is considered cured he is discharged, and may then have a further period of waiting until he starts work again There are very obvious defects in such a system Yet nobody will say that this account is unfair to the average general hospital

Conditions are very different in a special fracture clinic The patient receives his first treatment either at the hands of the experienced surgeon in charge or of an assistant trained in fracture technique During his stay in the ward he remains constantly under the same expert supervision He is surrounded by healthy men in various stages of recovery and the atmosphere is one of optimism and the will to recover When he becomes an outpatient he remains under the supervision of the same surgeon, who by now knows him and his injury pretty well, and his progress to full functional recovery is uninterrupted In due course he may start light work, but he is still under the supervision of the surgeon in charge of the clinic until he is back again at full work Centralisation and continuity of control are the essentials of such a system and the secret of its effectiveness Its success in practice is no less certain than its advantage in theory Those who have seen BÖHLER'S clinic in Vienna will none of them doubt that this is the general system under which fractures should be treated, even though they may disagree with details of his method Though it is hard to imagine BÖHLER'S clinic without BÖHLER, his enthusiasm, his energy, and his personal interest in every patient at every stage of his progress should be characteristic of the surgeon in charge of any fracture clinic We may not go all the way with W H OGILVIE in saying that "personal care and enthusiasm count for more than actual technique in the treatment of fractures," but we must admit that personal care and enthusiasm are essentials in the chief of a fracture clinic—in addition to surgical ability and experience. If such a man is to give so much of his time and energy and abilities, what is to be his reward? On the present system of honorary appointments at voluntary hospitals his financial reward is less than nothing Not only is his appointment honorary, but the amount of time he must spend at it will greatly reduce his opportunities for remunerative work elsewhere Some modification of this system is obviously necessary and the interdepartmental committee favours the giving of a substantial honorarium to the surgeon in charge of a fracture service

Unfortunately specialisation in the treatment of fractures will affect others besides the patient and the surgeon who specialises In the first place the remaining general surgeons will be deprived of the profit and interest of treating fracture cases But this has been the criticism every time a move has been made to divert one of the streams of surgery into the channel of the specialist, and it can only be said that if the specialist shows that he is able to do the job better than the general surgeon, then he should be allowed to do it The student's point of view must also be considered, and on the whole he will benefit In a few attendances he will see a great number and variety of cases at all stages of treatment and he will have the advantage of watching an expert treat fractures the theoretical teaching will also presumably be better But he will probably be burdened with an addition to his curriculum, for he must still do his six months' general surgical dressing, and he may find too that the expert team will not be able to offer him a place, so that he will not be able to "get his fingers into the business" which is such an important part of surgical training and will have to be content with watching This at any rate has been the result of specialisation in some other departments of surgery

Finally one may consider whether a fracture service might be extended to include other allied

conditions. The orthopædic department is the obvious next-of-kin to the fracture service, and the two have much in common. In several English cities the surgeon in charge of the fracture service of a hospital is one of the orthopædic surgeons, and the arrangement seems to work fairly well. A rather different question is whether a fracture service should be extended to include all other types of injury and become a general traumatic service. Some conditions such as lacerations, sprains, and all injuries of the limbs are certainly suited to treatment in a fracture service, but others are obviously not suitable—for example, injuries of the head and abdomen which are obviously best treated by specialists in cranial and abdominal surgery. These lesser problems however will solve themselves once the major question is decided, Should specialised fracture services be established? We believe the answer is, emphatically; Yes.

NEUROSIS OR PSYCHOSIS?

Professor RYLE's Croonian lectures, concluded in our present issue, remind us very forcibly of the close interrelation between mental disorder and bodily dysfunction. The psychiatrist is at times apt to forget the physiological consequences of emotion. On the other hand, the general physician tends inevitably to think in terms of the somatic manifestations of minor mental upsets. In the busy consulting-room there is seldom enough time to build up a complete picture of the mental life behind the spastic colon. If the physiologically minded physician can join hands with the psychiatrist we may hope to arrive at a balanced understanding of the visceral neuroses. Meanwhile, psychiatrists find themselves in a position of increasing complexity. As they examine the mental changes of their less severely ill patients, they are continually faced with the question of the difference between a neurosis and a psychosis.

Like socialism and malnutrition, neurosis is easy to talk about but hard to define. We can recognise only too well our neurotic patients and we can as a rule tell when we meet the legally *insane*. But the psychotic patient does not necessarily hear voices or see visions and the conduct of the neurotic may well cast doubts on his sanity. YELLOWLEES[1] puts the case for one school of thought clearly and concisely.

> "Neurotics, generally speaking, are made, not born. I believe it to be far otherwise with the psychoses, the causes of which are more deeply and mysteriously biological. Psychotics are born, not made."

Clinically YELLOWLEES says that the essential difference is the insight into the illness or lack of insight: "In spite of all kinds of exceptions, qualifications and modifications, I know of no better, and indeed of no other, means to judge whether we are dealing with a psychosis or a neurosis, than to apply this test of insight." In other words, the neurosis is a product of environment and the psychosis of heredity; the neurotic retains his insight and his touch with reality, while the psychotic does not

But, on the basis of careful clinical observation of the so-called borderline cases, there is growing up another school of thought. This school finds that in the causation of the neuroses and the psychoses both heredity and environment play their part; the hysteric often has an abnormally psychopathic family history, while the gross endogenous depression may be precipitated by a family or business misfortune. Further, they say that the advanced hysteric is completely lacking in insight, while the early schizophrenic often has enough insight to realise the bizarre stupidity of his symptoms and to seek relief for them. The conclusions of this school have lately been stated thus by SYMONDS[2]:—

> "The distinction between a minor mental disorder (a neurosis) and a major mental disorder (a psychosis) is one of convenience. All the primary mental disorders are 'functional' nervous disorders, being without known pathology, or specific ætiology. At one end of the scale, however, there are patients whose mental disorder is of a degree which might cause them to be regarded as insane by conventional standards—for example those of a Justice of the Peace. It is convenient to have a separate medical term for these patients and they are called psychotic, all other degrees of mental disorder being neurotic There are certain types of mental disorder which very rarely become psychotic—for example hysteria. The schizophrenic patient on the other hand often becomes psychotic at quite an early stage of the illness. Between these extremes lies the affective type of mental disorder which may be either of the neurotic degree (anxiety neurosis, neurotic depression) or the psychotic degree (manic-depressive psychosis).
>
> ". . . There is in my view no essential difference between a neurosis and a psychosis except that of degree. This is opposed to the opinion at one time widely held that a neurosis and a psychosis were two quite different diseases and of different ætiology, an opinion largely founded on the belief that all neuroses could be accounted for in terms of psychological conflict or motivation."

At once a difficulty presents itself. If the term psychosis be reserved for the legally insane, while neurosis covers the rest of mental illness, the early schizophrenic, as quoted by SYMONDS, is not psychotic but neurotic, while the rare but occasional certified hysteric is not neurotic but psychotic. Such reasoning leads inevitably to the conclusion of MAPOTHER and LEWIS[3]: "The distinction between neurosis and psychosis is at times convenient, but without substance." This does not mean that hysteria, the anxiety state, and the obsessional state are not definite diagnoses. It simply means that, although they do not as a rule require institutional treatment, they differ essentially from schizophrenia, paranoia and mania only as these differ from one another and not, say, as diseases of the skin differ from those of the liver

To state dogmatically that either of these schools is correct would be premature. If the conception of the neuroses and the psychoses as two essential varieties of mental disorder is to die, it will probably die hard. While the battle rages perhaps the safest place is the fence.

1. Yellowlees, H., Clinical Lectures on Psychological Medicine London, 1932.

2. Symonds, C. P., *Guy's Hosp. Gaz.* Aug. 12, 1939, p. 258.
3. Mapother, E., and Lewis, A., *Price's Textbook of the Practice of Medicine* (5th ed.), London, 1937

CHILDREN AT THE PICTURES

NEARLY five million children in this country go to the cinema as a habit once a week, and many thousands go more often. "Children in the Cinema,"[1] by RICHARD FORD, is therefore very welcome. Its findings are so objectively set out and its conclusions so free from bias that they deserve the consideration of all concerned with the healthy development of children. That the cinema influences the child's habits of speech nobody can seriously doubt who has heard a six-year-old patient reply "O K chief" to a request to put out his tongue. Does the film similarly influence behaviour? A speaker at the conference of the central women's advisory committee of the Conservative party, on May 11, 1938, is thus reported: "We all know that there is a very great increase in juvenile crime. It is the considered opinion of those who know that this is very largely due to the effect of unsuitable films upon children." A magistrate, presiding over a juvenile court where a charge of shop-breaking was brought against three boys, said, "These lads go to the pictures and see dare devil things, and they are imitating them. I have never been to the pictures in my life, although I am over seventy." On the other hand, at the child-welfare committee of the League of Nations the British representative said that the conclusion they had come to at the Home Office was that there was very little crime deliberately due to what the child had seen at the cinema. And the HOME SECRETARY expressed himself thus in the House of Commons: "Our inquiries go to show that today the young are not more wicked than they were, but that they are less controlled by their parents. It is not so much films and shilling shockers that make juvenile crime, but broken homes, indulgent mothers, unkind stepmothers and unemployment." Child psychiatrists apparently agree with the Home Secretary. Dr EMANUEL MILLER, speaking at a conference on films for children in 1936, said, "The films no more produce criminals than the amorality of our dreams induces us to commit crimes. I have not known a single young delinquent, of more than 100 I have studied, who was deeply influenced by films of crime. They may act the gangster, but they do not follow his career!" Prof. CYRIL BURT, in his book "The Young Delinquent," writes of cases in which the opening of a cinema had reduced hooliganism among boys, withdrawn young men from the public house, and supplied girls with a safer substitute for lounging with their friends in the alleys or the park.

It seems that the usual reaction of the juvenile audience to a film is to identify itself with the sympathetic character, usually the hero or heroine. In one of the most popular types of film, the "Western" serial, the children identify themselves with the cowboy hero: they are not in the least shocked or horrified by the innumerable sudden deaths that occur provided their hero escapes unscathed. Right triumphs over wrong, and right can always be identified in the dustiest mêlée by his big white hat. This process of self-identification explains, too, the success of the child star. In slapstick comedy the child appears to play the part purely of a spectator, though usually a highly appreciative one. Of the cartoon films, the purely comic variety, including most of the adventures of Mickey Mouse and Donald Duck, are extremely popular. But some of the more fantastic Disney cartoons, in which grotesque animals and bogy men take part, are really terrifying. Mr FORD reports that 923 elementary-school children in Birkenhead were asked whether the pictures ever frightened them, and the replies were: no, 465; yes, 148; sometimes, 208. Most authorities consider that fear in a children's audience is highly undesirable, and this was given official recognition by the censors' introduction of the Horrific category—"H" films. It is difficult to foresee what is likely to frighten young children. They appear to demand a stable order of things and any threat to this order is violently resented. Broadly speaking, one may say that, if the film contains a character with which the child identifies himself, any gruesome or painful thing happening to this character will cause distress. This must not be confused with the excitement and even creeping of the flesh, which is usually entirely pleasurable, occasioned by the thrills of the "Western" serials and the gangsters. In the grotesque Disney cartoons, and in films with villainous characters, a close-up, or worse still an ugly face gradually enlarged to give the illusion of approaching the spectator, will produce the silence of real fear. Indeed this gradual enlargement of objects is the essential feature of many nightmares. The supernatural is also apparently acutely unpleasant to the child; of 1439 children studied by the Birmingham Cinema Enquiry Committee,[2] 350 admitted that their sleep was disturbed by fear or bad dreams. It is interesting, but not surprising, to find all observers agreed on the harmlessness to child audiences of prurient or erotically suggestive passages. Love, and those substitutes which the cinema is so prone to portray, are considered by children as incomprehensible and profoundly boring. Only to the adolescent and the ill educated adult are they possibly depraving.

Efforts are now being made to select, from the general commercial output of the film industry, films suitable for children, and to show these films at special performances. But on the constructive side of making special films for children, whether for entertainment or education, the industry has not made much progress. Many of the difficulties have been financial, but public ignorance and apathy are the real hindrances to progress. The medical and teaching professions are generally unaware of the very important place which the films are taking as a formative influence on the ordinary child's mind. The direction of this influence into channels of a higher cultural value is a matter of importance and urgency.

1 Children in the Cinema. By Richard Ford. London: George Allen and Unwin. 7s 6d.

2 *Lancet* 1931, 1, 1409.

ANNOTATIONS

THE PREVENTION OF FIBROIDS

ON p. 420 Professor Lipschütz and Dr. Vargas record experiments supplementing those they described in our issue of June 10. They then showed that fibromyomas of the uterus can be produced in castrated guineapigs by the continued administration of œstrogenic hormones. In commenting on their findings we expressed the view that the appearance of these tumours might be prevented by the simultaneous administration of hormones known to be physiological antagonists to œstrogens, such as the luteal hormone of the ovary (progesterone), or the thyrotrophic hormone of the anterior pituitary. This possibility has been recognised also by Lipschütz and Vargas, and the results reported in their present paper fulfil the prediction as regards progesterone The new observations explain why fibroids can be induced with œstrin more easily and regularly in the castrated animal than in the intact one They also give further support to the view that fibroids in human beings arise through a disturbance of endocrine balance—a conception in accordance with the clinical features of the disease in women A rational treatment based on this conception, making use of either progesterone or the thyrotrophic hormone, appears therefore a possibility, and one which might now be justifiably explored by clinicians called upon to treat small *fibroids*.

This work raises too a question of general pathological interest—can uterine fibromyomas still be classed with the true tumours? Hitherto they have been regarded as benign tumours, but true tumours, whether benign or malignant, have the property of autonomous growth—i.e., they continue to grow when the stimulus that has led to their appearance is withdrawn. Experimentally these uterine fibromyomas regress when administration of œstrogenic hormone ceases, and this absence of autonomous growth constitutes a difference which justifies their separation, as non-neoplastic tumours, from the true benign neoplasms It is possible that further investigation of the causation of other types of tumours now believed to be benign neoplasms may add other examples to this group of non-neoplastic tumours The importance of drawing such a distinction, if it exists, need not be emphasised Not only is it of theoretical interest but it is bound to influence treatment.

THYROTOXICOSIS, INFECTION AND THE HEART

MANY workers believe that the streptococcus has something to do with rheumatic fever, but that there is another undiscovered ætiological factor which operates in conjunction with it Some have sought this missing link among the filtrable viruses, others in an altered functional state of the tissues of the rheumatic patient There is evidence in support of a hereditary abnormality, possibly in the form of an altered serological response to streptococcal infection. The suggestion that vitamin-C lack prepares the soil so that rheumatic fever is produced by streptococcal infection is out of favour now, but the work on which this hypothesis was based did at least point the way to the experimental study of myocardial damage. Now interest is turning towards endocrines. Schultz [1] finds that repeated injections of adrenaline produce minor lesions in the hearts of guineapigs, but that streptococcal infection does not intensify the damage. Infection is important in causing non purulent myocarditis in animals treated with insulin or thyroxine. The results with thyroxine are particularly interesting because of the tendency for Graves's disease and rheumatic fever to occur in the same individual However the changes in the animals' hearts did not resemble at all closely those seen in rheumatic fever. The serous myocarditis and myocardial fibrosis which were produced were like the lesions seen in exophthalmic goitre, and suggest that infection occurring in this disease may cause permanent damage to the heart. The way these experiments worked is obscure. Studies with endocrines, dinitrophenol, vitamin C, and ultraviolet irradiation suggest that increased metabolic rate and cardiac overwork are not alone responsible. Thyroxine caused a slight increase in the rate of antibody formation but the relationship between this and carditis was uncertain.

"DORMANT" LEAD POISONING

THE Manchester inquest on a painter, reported in our columns last week under the heading "Lead lying dormant?" ended in the jury returning a verdict of accidental death due to the man's occupation. While it is a valuable function of the coroner's court to draw attention to the dangers connected with industrial employment, the 1936 report of the departmental committee on coroners deprecated the tendentious verdict which may seem to trespass into the field of civil liability and, in cases where the application of the Workmen's Compensation Act may ultimately be an issue, to anticipate the decision and to interfere with the jurisdiction of the county court judge by whom that particular issue will be tried. The verdict of the coroner's jury is in no way binding upon the county court.

Whatever the appropriate tribunal, the parties possibly concerned with the aspects of civil liability may be left to seek decision there It may perhaps be permissible to add, without particular reference to the facts of the Manchester case and certainly without any intention to prejudge any litigation some general observations on lead poisoning This form of industrial disease has in the past been accused of causing various conditions now known to have no connexion with it—illnesses ranging from disseminated sclerosis and paralysis agitans to general paralysis of the insane and lymphocytic meningitis In any investigation of causes, special attention must be devoted both to the clinical picture and to the occupational history. Possible sources such as drinking-water will naturally not be neglected The available material would include the methods and habits peculiar to the patient—points perhaps unknown to a workman's employers. Suppose, for instance, that a post-mortem examination of a middle-aged workman reveals no lesions other than a terminal bronchopneumonia but discloses comparatively large quantities of lead in the liver, kidneys and brain, although evidence at the inquest negatives any history of exposure to lead for many years past With the indications of a high circulating lead, what would be the likelihood that lead absorbed many years ago could have been mobilised in sufficient quantity to cause lead encephalopathy? On the one hand Aub and his co-workers showed, many years ago, that lead could be drawn into the circulation from the bones by influencing the direction of calcium flow.

1 Schultz, M. P., *Publ Hlth Rep., Wash* July 7, 1939, p 1205

On the other hand, it is now believed that this mobilisable lead is stored in the bone trabeculæ, and that, when absorption ceases, part of it slowly passes to the blood, from which it is excreted, and part passes to the hard bone where it is much less easily affected by changes in the body fluids Toxic episodes can be precipitated by various means for a short period after absorption, but is there any evidence that lead can be mobilised in sufficient quantities to cause characteristic symptoms after a lapse of many years? Will those concerned with industrial lead poisoning support the interpretation Dr Gordon Ward places on the facts he reports in our correspondence columns this week?

THE RHEUMATIC NODULE

RHEUMATIC subcutaneous nodules were described early in the nineteenth century, were studied microscopically over fifty years ago, and are still the subject of mild controversy Meynet in 1875 thought them extremely rare, whereas Cheadle in 1889 found them common in children Coburn in 1931 recorded them in 11 per cent of his patients,[1] while Wilson,[2] observing cases in the same city over a longer period, found them in as many as a third Their specificity is not often questioned, but the nodules of rheumatoid arthritis resemble them clinically, and the microscopical appearances are similar, although Collins[3] thinks them not identical Carey Coombs in 1924 wrote that the subcutaneous node was the most rheumatic of the rheumatic phenomena, but admitted seeing it in subacute rheumatoid arthritis and in a case of chronic ulcerative carditis (However, coincidence of the cardiac lesions of bacterial endocarditis and Aschoff's nodes has been demonstrated many times, and Coombs's patient may have had both diseases) Carpenter in 1901 reported nodules in infants with no other sign of rheumatism, but if rheumatoid arthritis is excluded it is fairly safe to regard typical nodules as diagnostic of rheumatic fever, and the old working rule that they signify cardiac involvement and a severe infection is just Cheadle regarded "the eruption of large nodules as almost equivalent to a sentence of death," and Coombs believed the "most serious omen as a form of onset is the subcutaneous node" Wilson[2] studied 20 rheumatic patients who were under regular observation in the first three decades of life and noted that 5 of them had nodules, none at the onset Of 20 who died in this period, 8 had nodules, 2 of them at the onset So nodules do not make the prognosis hopeless

The experimental side is controversial too Passing over the production of nodules in the rabbit by intravenous inoculation with the micrococci of Poynton and Payne in 1913 and in the guinea-pig by a combination of vitamin deficiency and streptococcal infection[4] we have to consider the claims of Massell, Mote and Jones[5] to have produced nodules in man They injected procaine and some of the patient's blood into the subcutaneous tissues over the olecranon process, and made each patient rub his injected elbow on the bed for several minutes, six times a day, for ten days The experiments were well controlled, and 18 out of 20 children with clinical rheumatism developed nodules The third item of our new contemporary *Annals of the Rheumatic Diseases* contains an article by F Dudley Hart[6] describing similar experiments, with completely negative results The only differences between the methods were that Hart used no procaine, and friction was applied with the patient's hand "several times a day," and may not have been vigorously applied We know of another experimenter who injected blood distal to the olecranon process, and told the child to rub the elbow on the bed, a moment's trial makes it clear that friction is thus applied over the proximal aspect of the olecranon process, and nodules subsequently appeared there, not where the blood was injected The common sites for the natural formation of nodules are where a bony surface is exposed to the small irritation of the bed clothes, and it is hard to think that friction or pressure is not a major factor

Whatever may be the cause of the discrepant findings, we must await further investigation—in the faint hope that the differences will be resolved, but with a sanguine expectation of further disagreement

THE YEARBOOK OF THE LEARNED WORLD

THIS invaluable publication, comprising the sections of Minerva[7] concerned with the universities and technical high schools of the world, contains particulars of the staffs of all the seats of learning from Cambridge to Calcutta and from Simferopol to Santiago Its completeness reflects the greatest credit on Dr Gerhard Lüdtke, its editor, and on Dr Friedrich Richter, his assistant To both and to the publisher the learned world owes an ever increasing debt

URETERIC TRANSPLANTATION INTO THE INTESTINE

ANASTOMOSIS between the ureters and the large bowel is carried out in cases of congenital malformation of the bladder and as a preliminary to removal of the bladder for malignant disease In view of the severity of the operation of total cystectomy it is most desirable that any method of deviating the urinary flow that precedes it should be simple, and for this reason there is much to be said for transplanting the ureters into the loin Unfortunately, however, as Mr Henry Wade[8] pointed out in his Honyman Gillespie lecture, no apparatus has yet been devised that will keep a patient dry whether standing, sitting and lying, so that in spite of the low mortality, this operation has rightly been discarded The risk of fatal ascending infection when the ureters were transplanted directly into the bowel was appalling, but this has been largely overcome since Coffey introduced his [illegible] method of anastomosis In [illegible] uses transplantation into the [illegible] has always carried out the [illegible] but Wade, employing a [illegible] transplants both ureters [illegible] details in his procedure [illegible] catheters to keep the [illegible] administers continuously [illegible] sulphate for the first [illegible] the urinary flow, and [illegible]

1 Coburn A F Infection in the Rheumatic State, Baltimore and London 1931
2 Wilson M G *J Pediat* 1937 10 126
3 Collins D H *J Path Bact* 1937 44 97
4 Rinehart J F, Connor C I and Mettler F R, *J exp Med* 1931 53 97
5 Massell B F, Mote J R and Jones T D *J clin Invest* 1937 16 125
6 Hart F D [illegible] of the [illegible] H K Lewis and Co 1939
7 Minerva Jahrbuch der Gelehrten Welt [illegible] 1939
8 Wade H [illegible]

rectum to ensure the free escape of urine Wade has carried out this operation in 54 cases, and in his more recent series has had only 1 death in 11 patients operated on for non-malignant conditions and 6 deaths out of 14 patients with carcinoma of the bladder. The operative risk of this procedure is therefore not prohibitive.

The second standard method of uretero-intestinal anastomosis is transplantation into the rectum, which was first carried out by Simon in 1851, and one type of which is described by Prof Shilovtzeff on p. 412. In Shilovtzeff's series the operative mortality was high, for he had 5 deaths in his 19 non-malignant cases. As he says, however, ectopia, which was the condition present in 12 of these, is itself highly fatal, and he maintains that his operation presents few technical difficulties even in infants. Coffey's technique and its modifications have the disadvantage of being elaborate, and any simplification that does not entail greater risk is of value. The transplantation of both ureters at one operation, advocated by both Wade and Shilovtzeff, is also much to be desired, since separate transplantation in a case of carcinoma of the bladder may mean four operations—an exploration, two operations for transplantation, and a cystectomy. There are few patients who will tolerate such an ordeal.

OSLER UP TO DATE

OF the many writings of Sir William Osler, perhaps none has had so wide an appeal to all sorts and conditions of men as Aequanimitas [1] Published in 1904 it has been republished many times since, and now thirty-five years since it first appeared it still has its message Reading again these pages it is easy to understand the reason for this continued esteem Almost every line is the credo of the most distinguished clinical teacher of his day, expressed in language which is not only full of literary and philosophical allusion, but is itself a notable example of the best English prose tradition. In one address he lays emphasis on the international unity and concord of the medical profession. In these days of political upheaval Osler would at least have had the consolation of finding that medical friendships and international medical interchange have endured in spite of differing state ideologies. No-one who is seeking to join, or already belongs to, the medical profession can find a more inspiring leader Sir Walter Langdon-Brown contributes a brief and sympathetic note recording the impression which Osler made on those whose privilege it was to know him.

If Aequanimitas gives us an insight into the mind of the master as he himself wished it to be remembered, his bibliography,[2] laboriously compiled by Dr. Maude Abbott, shows him in a somewhat different light. He was a prolific and highly skilled journalist. He had an unerring eye for good copy, and tireless energy in putting it into shape He was essentially a transmitter and a sublimator of knowledge rather than a pioneer in untilled fields. His output of writings, speeches, and discussions was enormous, and we are filled with admiration for the skill and completeness with which Dr. Abbott has presented the results of her toil. The arrangement of such varied material is obviously important, and she has divided it under seven chief heads—natural science; pathology, comparative and human; clinical medicine; literary, historical and biographical; medical education; public welfare; and editorial. The longer sections are subdivided into the four main periods of Osler's life: at McGill, at Philadelphia, at Baltimore and at Oxford There is an excellent index, so that it needs no long search to discover any subject on which Osler made observation or reflection

Dr. Abbott prefaces her work with three admirable quotations, one from Osler himself, one from John Ferguson's Bibliotheca Chemica, which Osler quoted in the transactions of the Bibliographical Society, and the third from Sir Humphry Rolleston's Osler memorial lecture: "So wide were his contributions that any writer, especially if with a new idea, observation, or historical subject, would be well advised to find out before publication what Osler may have said" This volume makes the condition easy of attainment and all students of medicine and literature will be grateful to Dr Abbott.

SPITTING

EXPECTORATION is so commonplace that its physiological significance and mechanism have been neglected It should be a subject of special interest to workers in one of the new clinical research departments, as most of our knowledge has in the past been collected by clinicians. Just over ten years ago Cecil Wall [1] dealt fully with the musculoskeletal mechanism of expectoration. He described how, by raising intrapulmonary pressure and then suddenly allowing the air to escape, any peccant matter that might be lying in the air-passages was carried away. About the same time interest was revived in ciliary movement and its part in removing secretions. It was nearly a century since Sharpey [2] had shown that cilia worked together to move a sheet of mucus in a constant direction. For many years nothing further was added to this knowledge, until Leonard Hill [3] demonstrated that secretion and foreign particles are carried by the cilia to the larynx comparatively quickly, and that they work best in a neutral medium with the mucous membrane evenly stretched As might be expected, the rate of motion is accelerated in the horizontal position when the influence of gravity is removed. Hilding [4] pointed out that the secretion in the nose and accessory sinuses is carried backwards by the cilia into the nasopharynx, a finding which was confirmed by Lucas and Douglas [5] These workers went on to show [6] that neurogenic impulses in the bronchi and trachea affect the rate of secretion but not the rate of motion of the cilia Thus the rate of evacuation of secretion (that is, the efficiency of ciliary propulsion) is a function of its consistency

A mass of evidence therefore proves that throughout the bronchial tree a sheet of mucus is steadily being moved by ciliary action towards the larynx from the periphery In addition, another sheet of secretion is being pushed towards the larynx from the upper air-passages by a similar method Nasopharyngeal secretions are normally swallowed, but, though not expectoration in the literal sense, they may be hawked or coughed up in disease Muscular action

1 Aequanimitas · With Other Addresses (3rd ed) By Sir William Osler, Bart, M D, F R S With a biographical note by Sir Walter Langdon-Brown London H. K. Lewis and Co 1939 Pp 451 7s 6d

2 Classified and Annotated Bibliography of Sir William Osler's Publications (2nd ed) Edited by Maude E Abbott, B A, M D, LL D McGill Montreal The Medical Museum, McGill University 1939 Pp 163 $2 25

1 Wall, C, *Lancet*, 1928, 2, 957
2 Todd's Cyclopædia of Anatomy and Physiology, London, 1835, vol 1, p 606
3 Hill, L, *Lancet*, 1928, 2, 802
4 Hilding, A, *Arch Otolaryng* 1932, 15, 92
5 Lucas, A M, and Douglas, L C, *Ibid*, 1934, 20, 518
6 Lucas and Douglas, *Ibid*, 1935, 21, 285

assists the progress of these two sheets of mucus The thoracic movements described by Wall act as a gross method of propulsion, but there are, in addition, finer movements of expansion and contraction of the bronchi[7] occurring at each phase of the respiratory act A bronchoconstrictor reflex also facilitates the expulsion of secretion The most violent movement of expectoration is the cough which is reflexly excited when secretion in excess of normal reaches certain areas of the bronchial tree These sensitive areas are chiefly the carina and larynx, but also to a lesser degree the larger bronchi and trachea Chevalier Jackson has said that 'the cough reflex is the watch dog of the lungs," and certainly it is the most dramatic method of evacuation of unwanted material

Thus secretion is removed from the lungs by a combination of four methods, and H C Ballon[8] has recently reviewed the mechanism He also describes experiments which show that foreign bodies or secretion can be coughed out of a lung even when the diaphragm on that side is paralysed Maxwell Ellis[9] had previously demonstrated that any change in capacity of the thoracic cage is synchronously accompanied by a change in the calibre of the bronchi, and that a lung can empty itself of secretion even in the presence of a pneumothorax As a corollary, Ballon states that healthy lung is protected against secretions emptied into it from diseased pulmonary tissue by an increase in tone of its bronchial tubes There is again experimental evidence to show that variations in bronchial tone occur not only as a result of stimuli but also in an apparently quiescent animal[7] Pharyngeal movements assist the cilia of the upper respiratory tract in the propulsion of secretion, and, when secretion is excessive or irritant, the larynx is excited to produce the cough reflex This occasionally gives rise to an erroneous diagnosis of pulmonary disease, for instance "haemoptysis" is often a manifestation, and sometimes the only one, of epistaxis Further inquiry into this complicated and important bodily function is certain to produce results of great interest as well as of clinical value

INDIA GOING DRY

It is perhaps chiefly for emotional and religious reasons that Congress has adopted the prohibition of alcohol as a plank in its programme Nine Indian provinces have now introduced prohibition in limited areas, and each has had to face considerable financial losses from excise revenue and the cost of preventing smuggling and illicit distilling On Aug 1 Bombay city went dry The estimated drink bill was formerly 3 million pounds a year, of which half went to the government in excise The drink trade was in the hands of the Parsees and the first day of prohibition was marred by riots between Hindus celebrating the end of an abuse and Parsee agitators protesting against the new property tax which is intended to bridge the deficit in the revenues Eight hundred volunteer prohibition guards among them students, doctors and lawyers, are helping to enforce the law, and 20,000 members of various physical and cultural organisations have also offered their services

Bombay is introducing prohibition in an urban area, whereas other provinces have preferred to start in rural parts For over a year the Madras government have been enforcing prohibition in a rural area centring around the town of Salem Prof P J Thomas, an economist at Madras University, regards the initial results as extremely encouraging[1] Formerly the average annual drink bill among certain classes of Salem workers was 132*s*, of the 2,500,000 total population not more than 200,000 took drink, but the liquor sales of the district exceeded an annual average of £2 a head The first effect of prohibition on manual workers was apparently loss of energy and zest for hard work, aches and pains increased and absenteeism was common Later, however, attendances rose from 63 per cent to 91 per cent and a monthly bonus of 3*s* for regular attendance, previously earned by 10 per cent of the workers, was earned by 75 per cent Output also increased All classes of workers consumed more vegetables, milk, ghee (melted butter) and curds When Thomas wrote his report the cinemas in Salem had increased from four to six and their daily takings from £15 to £38 Expenditure on shoes, umbrellas, soaps and clothing had nearly doubled, and debt repayment had improved

At the same time it would be unwise to say as yet that prohibition has proved itself in India The large majority of Indians have been for many years total abstainers, and an open hostility to alcoholic beverages has almost confined intemperance to the lowest strata of society It is arguable that the intemperate addict who has defied the deeply rooted age long prejudice of the majority will not find solace in passively diverting his income to socially desirable expenditures He may still waste his substance on gambling, ganja, opium, and other narcotics

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Air Vice Marshal Sir ALBERT RICHARDSON director of medical services at the Air Ministry, has been promoted to the rank of Air Marshal

The seventh International Congress on Rheumatism will be held at New York, Philadelphia, and Boston from June 1 to 10, 1940 Further information may be had from the Ligue Internationale Contre Le Rhumatisme, Keizersgracht 489, Amsterdam, Holland

The death is reported from Moscow of Prof M B KROL, director of the clinic for nervous disorders at the All Union Institute of Experimental Medicine Born in 1879, Prof Krol was chief physician at the Kremlin Hospital from 1934 to 1938 and in 1935 he headed the Soviet delegation to the second International Neurological Congress in London

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7 Ellis M *Lancet* 1934, 1 419
8 Ballon H C *Amer Rev Tuberc* July 1939 p 1
9 Ellis M *J Physiol* 1936, 87 2*p*

1 Thomas P J, A Survey of the Economic Results of Prohibition in the Salem District, Oct 1937, to Sept 1938 University of Madras 1938

"The man of science has shown a sad lack of imagination in his nomenclature of the vitamins The use of A, B, C, D, E etc, conveys nothing to the man in the street, who cannot possibly be expected to memorise their functions They might at least be given names which indicate that they are antiscorbutic or antirickets or provitrity or something else Their appreciation by the public is being retarded by the inability to talk about them by appropriate names Our literary friends must cease their smiles at our impotence and come to our assistance—a nation which finds names for its racehorses should not be defeated by a few vitamins"—L E, Anstruther I R S, in his review of 'The Englishman's Food" by Prof J C Drummond and Anne Wilbraham, *Nature Lond* Aug 12, 1939, p 2*c*

SPECIAL ARTICLES

PUBLIC-SCHOOL AND SECONDARY-SCHOOL BOYS

A COMPARISON OF THEIR PHYSIQUE

BY H. BATHURST NORMAN, D.M. Oxfd, M R C.P.

IT is important to define standards of physical development which may be expected when the environment is optimum Spence (1935) has emphasised the value of a knowledge of normal—i e, optimum—standards of physique: "The time is ripe for a re-examination of standards of physique and growth and if necessary for the formulation of new standards which represent what are desirable and attainable levels of physical growth for the people of this country . . . it should be possible to know what stature may be hoped for in people if they are brought up under ideal nutritive conditions" Gray and Jacomb (1921) have compared certain of the current physical standards with actual observations of 136 healthy private-school boys from wealthy American homes in order to determine which of these standards is most suitable for use in connexion with this particular class Their conclusion is that for judging the size and weight of children of the highest economic class totally new standards are necessary.

The years of adolescence are a critical period from the nutritive standpoint. A time of rapid growth is associated with the physical and emotional adjustments of puberty and educational tests or long hours of unaccustomed work have to be faced for the first time. But the state of nutrition at this period has been less fully investigated than amongst children of school age, and in particular there is a lack of standards based on recorded measurements of groups of adolescents whose home environment, health record and heritage present a favourable combination.

The material of the present investigation comprises 1001 adolescent males between the ages of thirteen and eighteen years Of these, 500 are public-school boys drawn from that 10 per cent. of the population which is comprised in the nutritional group VI of Sir John Orr (1936) In this group alone the standard requirements of the various nutritive elements for the maintenance of perfect health are exceeded in every instance. The remainder are a homogeneous group of secondary-school boys in the county of Durham. The following measurements are recorded for each group: (1) height; (2) weight; (3) sitting height; (4) lumbar pull, measured by the dynamometer; (5) chest girth on expiration and inspiration.

At the public school I was fortunate enough to have the assistance of a science master who had had previous experience of biometric work with boys. In Durham Dr. George Wilson, deputy director of education for the county, most kindly helped with the measurements

The age-groups are taken from the last and not from the nearest birthday. Thus under the heading "15" are included boys between their fifteenth and sixteenth birthdays The other ages are similarly treated While it was recognised that the use of the metric system has many advantages in recording measurements, it was thought wise to follow the usual practice of workers in this country and give records in English weights and measures.

Care was taken in the supervision of the actual measuring to ensure that the figures from the two groups were strictly comparable The work was carried out by a single investigator assisted in each case by a worker of experience, and every effort was made to maintain "that continual *animus mensurandi*, absence of bias and the correctness of scales" demanded by the British Association committee of 1883.

The object of the inquiry was not merely to study the physique of two groups of different economic standing but rather to indicate adolescent physical standards to be found where conditions of environment and nutrition are optimum. The second series of measurements representing an average sample of adolescent physique as found in secondary schools is included to allow a comparison to be made between the two groups It is hoped that this may be of interest in the light of recent reports which have shown that the diet of those attending secondary schools compares unfavourably with that of public school boys.

For the purpose of this comparison simple observations which are recognised as throwing some light on nutrition have been made and are analysed statistically Physical measurements have been shown to give an index at least as satisfactory as a careful clinical examination; and it is probable that, in the present state of knowledge, as much reliable information about differences in the average state of nutrition of groups of children can be obtained by taking simple measurements as by any other means

WEIGHT

The weight was recorded to the nearest quarter of a pound. For strict accuracy the clothing should be removed and the bladder and bowels if possible be emptied before recording the weight The circumstances of the inquiry made this impossible, and weights were taken in shirt and trousers with coats, pull-overs, waistcoats and shoes removed. In measuring the public-school boys, the same weighing machine was used throughout. In Durham the boys were drawn from schools in Stockton-on-Tees, Durham City, Bishop Auckland and Spennymoor and it was necessary to use different machines for recording the weights The accuracy of these machines was in each instance tested before use

The annual increase in weight of the individual child is generally regarded as of great significance Friend (1935), speaking from his experience at Christ's Hospital, says: "The more experience one has of weighing as a routine, the more is one convinced that it is one of the most important clinical aids at the disposal of the school medical officer." A record of mean weights of groups of adolescents, though of less definite significance, is of real value as evidence of nutritional progress

The weight of clothing worn at the time of weighing was estimated by taking the actual weight of the clothes in a number of cases The weight was found to range from 3 to 5 lb. according to the size of the boy, representing approximately 3 per cent of the total recorded weight The field work was done during the spring and early summer of 1937, and although the measurements for the Durham boys were taken somewhat later in the year there did not appear to be any important difference in the weight of clothing worn by the two groups The weights recorded are the gross weights inclusive of clothing The numbers included in the age-groups thirteen to fourteen and nineteen to twenty are not sufficiently

TABLE I—WEIGHT (IN LB)

Age	Public school			Secondary school			Difference ± S.E Pub sch–sec sch	Difference S.E
	No of boys	Mean ± S E	S D	No of boys	Mean ± S E	S D		
13	21	102·26 ± 3 83	17 53	7	76 43	4 38	25 83	—
14	108	105 90 ± 1 61	16 78	94	91·27 ± 1 50	14 51	14 63 ± 2 20	6·65
15	103	123 48 ± 1 73	17 53	147	106·05 ± 1 51	18 31	18 43 ± 2 30	8·01
16	91	138 03 ± 2·03	19 40	113	122 55 ± 1 70	19·06	15 48 ± 2 71	5 71
17	119	142 54 ± 1 71	18 71	90	128 45 ± 1 76	16·62	14·09 ± 2 45	5 75
18	57	152 59 ± 2 31	17 46	27	133 15 ± 3 71	14 10	19 44 ± 3 56	5 46
19	11	154·07	11 76	23	140 50 ± 2 88	13 81	13 48	—

TABLE II—HEIGHT (IN INCHES)

13	21	62 68 ± 0 645	2 96	7	57 29	1 34	5 39	—
14	108	63 65 ± 0 295	3·07	94	60 19 ± 0 354	3 43	3 26 ± 0 461	7·07
15	103	66 64 ± 0 276	2 80	147	64 92 ± 0 295	3 58	1 72 ± 0 404	4 26
16	91	69 18 ± 0 312	2 98	113	66·02 ± 0 306	3 26	3 16 ± 0·437	7 23
17	119	69 59 ± 0 245	2 67	90	66 76 ± 0 338	3·20	2 83 ± 0 417	6 79
18	57	70 59 ± 0 336	2 53	27	66 96 ± 0 570	2 96	3 63 ± 0·662	5 48
19	11	70 69	1 70	23	68 34 ± 0 599	2 87	2 35	—

TABLE III—SITTING HEIGHT (IN INCHES)

13	21	30 83 ± 0 360	1 65	7	29 14	0 73	1 69	—
14	108	31 25 ± 0 163	1 70	94	30 49 ± 0 178	1 72	0 76 ± 0 241	3 15
15	103	32 91 ± 0 157	1 59	147	31 63 ± 0 171	2·07	1·28 ± 0 232	5 52
16	91	34 34 ± 0 187	1 79	113	33 64 ±0 163	1 73	0 70 ± 0·248	2 82
17	119	34 65 ± 0 141	1 54	90	34 24 ± 0 168	1 50	0 41 ± 0 212	1 93
18	57	35 40 ± 0 198	1 49	27	34 83 ± 0 263	1 36	0 63 ± 0 329	1 91
19	11	36·03	1·02	23	34 87 ± 0·226	1·09	1 16	—

TABLE IV—PULL (IN LB)

13	20	198 25 ± 19 81	88 58	7	157 86	13 05	40 39	—
14	106	213 62 ± 4 35	44 82	94	177 83 ± 2 88	27·90	35 79 ± 5 22	6 86
15	100	234 90 ± 4 92	49 18	147	218 76 ± 4 22	51 18	16 14 ± 6 48	2 49
16	89	289 46 ± 6 13	57 79	113	258 72 ± 5 03	53 51	30 74 ± 7 93	3 88
17	114	302 39 ± 5 34	56 98	90	276 63 ± 4 73	44 88	23 76 ± 7 13	3 61
18	56	327 14 ± 6 98	52 21	27	252·07 ± 9 50	49 34	45 07 ± 11 86	3 80
19	11	341 27	75 88	23	304·96 ±11 15	53 46	36 32	—

TABLE V—CHEST GIRTH (IN INCHES)

CHEST EXPIRED

13	21	27 54 ± 0 392	1 79	7	25 ·0	0·694	2·04	—
14	108	27 92 ± 0 197	2·04	94	26 82 ± 0 162	1 57	1 10 ± 0 25·	4 31
15	103	29 56 ± 0 208	2 11	147	28·22 ± 0 153	1 86	1 34 ±0·258	5 19
16	91	31 18 ± 0·228	2 17	113	29 75 ± 0 184	1·96	1 43 ± 0 293	4 88
17	118	31 78 ± 0 181	2·00	90	30 30 ± 0 181	1 72	1 48 ± 0·258	5 74
18	57	32 53 ± 0 230	1 74	27	30 88 ± 0 274	1 42	1 65 ± 0 358	4 61
19	11	33·05 ±	1 30	23	31 70 ± 0 305	1 46	1 35	—

CHEST INSPIRED

13	21	30 42 ± 0 344	1 58	7	28 36	0 924	2·06	—
14	108	31 12 ± 0 205	2 13	94	29 91 ± 0 161	1 75	1 21 ± 0 2·3	4 43
15	103	32 87 ± 0 196	1 98	147	31 42 ± 0 175	2 13	1 45 ± 0 263	5 51
16	91	34 55 ± 0·260	2 56	113	33 25 ± 0 206	2 19	1 33 ± 0 339	3 93
17	118	35 33 ± 0·210	2 84	90	33 84 ± 0 195	1 85	1 49 ± 0 287	5 19
18	57	36 23 ± 0 253	1 91	27	34 23 ± 0 313	1·63	2·00 ± 0 402	4·98
19	11	36 45	1·05	23	35 35 ± 0 366	1 76	1 12	—

S.E. = standard error S.D. = standard deviation

large to give information of value In the other age-groups there are considerable differences in favour of the public-school boy, who in each instance averages more than a stone heavier than the secondary-school boy (table I).

HEIGHT

The height was measured in socks, and the measurements were recorded to the nearest quarter of an inch Growth in height is generally regarded as being less quickly affected by under-nutrition than growth in weight. Table II shows the comparative heights of the public-school and secondary-school groups Here again there are significant differences at each age in favour of the former. The relationship of weight to height (W/H) has been used in the past for the assessment of physique. The value of this ratio gives little more information than do the two original measurements. Ordinarily good nutrition causes height to outstrip weight, so that the well-nourished child while both taller and heavier than the poorly nourished is at the same time lighter in relation to its height. It is therefore interesting to notice that in the present series of measurements the public-school boy is shown to be not only taller but also heavier in relation to his height than the secondary-school boy.

SITTING HEIGHT

In the measurement of the sitting heights Dreyer's method was followed (Dreyer and Hanson 1920). The subject is seated on a level board with the backs of his hands on the platform on which he sits, the fingers pointing backwards The knees are flexed, the lowest part of the sacrum being in contact with the measuring standard and the weight being taken by the ischial tuberosities. The measurement taken is that between the tuberosities and the top of the head This method avoids the introduction of errors which may arise from the contraction or relaxation of the posterior muscles of the thigh. The sitting height is recorded in order to discriminate between torso and true leg length.

Leg length is usually found to be greater where the environment is more favourable Where nutrition is defective the limb growth is delayed more than that of the trunk, and when the environment is improved there is a marked increase in the standing height. The available studies suggest that faulty conditions of environment have a close relationship to lack of growth of the lower extremities In table III the mean sitting height is given for the two groups These figures show less marked differences between the public-school and secondary-school boys and in the case of the two older age-periods the differences are of borderline significance. A comparison with the figures of the mean total height show a relatively increased length of leg in the public-school boy

PULL

The instrument used for the measurement of pull was the spring-balance dynamometer designed by Magee for work with school-children The strength of the lumbar pull is measured, and it is suggested that the muscles involved in this—those of the thigh, gluteal regions and trunk—are less likely to be specifically developed in some individuals than the muscles concerned, for example, in the hand grip. The instrument has an adjustable handle and the level of the upper border of the patella has been found the most suitable position after extensive trials Inconstant readings are obtained if the handle is not kept approximately at this level The pull is made with the subject standing directly over the handle, the feet resting on the base of the instrument, one on either side of the dial. The knees are kept straight but not rigid. This technique was followed in the present inquiry. Two pulls were made by each subject. It was explained that a maximum effort should be made and the figure recorded was the greater of the two pulls. A brief rest interval of approximately half a minute was allowed between the two efforts. Cathcart and his colleagues (1935), who used the dynamometer for investigating the physique of men and women in industry, have recorded experiments made in the laboratory to determine the effect of applying tests of grip and pull in rapid succession with no appreciable rest intervals, and in other series with intervals of 30 sec., 1 min. and longer. He concluded that the resting allowance could be reduced to 30 sec. or less without detrimental results Table IV shows the lumbar pulls of the two groups Magee (1935) records tests made with 100 public-school boys between the ages of twelve and a half and sixteen and a half in which the relation of the pull (P) to weight (W) was found to be 2 36, the variations being within 10 per cent. The figures of the present series show a somewhat lower value for this ratio

CHEST GIRTH

The chest girth was measured in both full inspiration and in expiration The most accurate figure for the chest girth is probably obtained by taking the average of the circumference on forced inspiration and expiration. There has been no uniform system of measurements in the past, the girth being taken at different levels and many workers preferring to use the resting chest girth which gives a somewhat different figure.

Physical training is important in considering the question of chest girth. In schools where this is in force measurements are likely to be increased At the public school under review there was at the time of this inquiry no system of physical training, while at the secondary schools some form of physical training was the rule. On the other hand opportunities for athletic exercises were much more plentiful for the public-school group. It was found that boys who had had chest measurements taken before and were practised performers were better able to empty the chest completely and the resulting measurements were better than in the case of boys who had had no previous experience of such measurements The method adopted was to take the measurements at the level of the ensiform cartilage, the subject standing in an upright position with the measuring tape in contact with the skin. Measurements were taken with the chest fully expanded and after forced expiration Table V gives the mean chest expansion at each age and it will be noticed that there is little difference between the public-school and the secondary-school boys.

DISCUSSION

The foregoing figures show well-marked differences between the physique of the two groups The physical development of the individual is determined by a number of diverse factors of heredity and circumstance. These are extremely complex and it is not possible to define with accuracy the influence exerted individually by diet, disease, constitution and environment.

The incidence of disease will fall most heavily on those whose economic circumstances are least good. The acute infections of childhood and chronic

septic infections of the mouth and nasopharynx may produce a permanent impairment of nutrition and the poorly nourished child of low vitality remains peculiarly liable to disease Poorer housing conditions, fewer opportunities for athletic exercise, excessive fatigue and inadequate hours of sleep may prejudice growth in the secondary school group Lack of knowledge of the principles of hygiene and of sound nutrition are prevalent to some extent in all classes of the community The character of the housewife has been shown to have a direct bearing on the height and weight of children In many households where purchasing power is adequate the income is often unwisely spent from the strict standpoint of nutrition Such ignorance is more prevalent in those sections of the community where it is likely to prove most damaging

Heredity is an important influence in the determination of stature If heights of adults and of children in any class of society are taken, it is found that in general tall parents have tall children But the assumption that differences in stature between the various economic classes are due to hereditary factors is not altogether justified. American observers have noted the remarkably improved physique of the children of Japanese, Russian and Italian immigrants into the United States, the children often being several inches taller than their parents During the last twenty years it has been found that there are a large number of dietary factors, a deficiency of which leads to stunted growth It is recognised that the diet of those in good economic circumstances is rich in these factors, while the diet of the poorer classes is in many cases so deficient that we would expect to find growth limited by the inadequate supply People on the same kind of diet tend to have the same stature, and the real correlation is often one of diet rather than of inherited genes In all cases the final limits of growth are set by heredity How nearly such limits are approached depends on a variety of environmental conditions of which correct nutrition during the growing period is one of the most important Thus short stature in the higher economic groups is in most cases inherited, while in the poorer classes, where dietetic deficiencies are known to exist, the inherited potentialities of growth are not fully realised Attention has been specially focused on the so called "protective" foods which are particularly rich in important minerals and vitamins Such are whole cereal grains, milk and milk products, eggs, fish, fresh vegetables and fruit The inclusion of such foods in diets previously deficient in them has been shown to produce a definite acceleration of growth accompanied by a general improvement in physical well being The children are more alert, and there is improvement in the colour of the skin, the general vitality and efficiency in athletic exercises

CONCLUSION

An attempt has been made to present as simply as possible a series of physical measurements of public school boys whose nutrition is unusually good It is suggested that these measurements may be accepted as standards for good physique for boys of similar age and race Another series of measurements taken under comparable conditions relates to secondary school boys whose physique would be considered satisfactory according to accepted standards There are significant differences At each year between the ages of fourteen and eighteen a boy of the first group is approximately 16 lb heavier and 3 in taller than a boy of the second group His lumbar pull is 30 lb greater The difference noted in height is shown to be chiefly a difference in the length of leg A record of the ratio of weight to height shows a greater weight per unit of height in the public-school group The figures suggest that the differences in physique are roughly maintained throughout the age period under review, there is no progressive deterioration on the part of the secondary school boy, nor is there any obvious tendency in the higher ages to approximate to the stature of the public school boy.

When failure in development is associated with defective nutrition the delay in growth is often made good by accelerated growth towards the end of the growing period There is no suggestion of any abnormal acceleration of growth in either group in the present study, the figures show that growth is well maintained at each age in both groups

It is not necessarily advantageous to accelerate the normal rate of growth An actual imbalance of growth is not uncommon at puberty, excessive growth in stature putting an undue strain on the limited energy resources of the adolescent and thereby curtailing development in other directions Visceral growth and cardiac reserves may temporarily lag behind skeletal development and it may be necessary to limit physical activity Height and weight are not themselves desirable objectives nor do they necessarily betoken good health When however growth is accompanied by obvious increase in well being and greater bodily and mental vigour, it is good evidence of an improvement in nutritional status

It is probable that the differences recorded in stature during adolescence are not equally marked in adult life Where nutrition is good early maturity in size and physique is the rule The period of growth is longer in the case of boys in less favourable circumstances and there is likely to be some approximation in stature after the age of eighteen due to the later maturity of the secondary school group It is emphasised that the differences in the physical development of the two groups as reflected in the present data correspond to differences known to exist in their diets, and it is suggested that a relative deficiency in food factors responsible for satisfactory growth has been instrumental in bringing about these differences

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" The keys to the successful organisation of science are freedom and democracy Nowadays freedom for individual research means more than the absence of prohibition or even of compulsion, it implies the provision of adequate material and help Thus the limitation of subsidies and organisation for science is probably the most effective way to stifle discovery, for discovery and fruitful application can no longer be counted on to come of themselves, they need intelligent provision The consciousness of a common aim binds people together far better than any autocratic ordering But the present organisation of science is not free and democratic, it is still in form authoritarian and hierarchical, and any new organisation must base itself far more on voluntary association and on the executive power of councils of all grades of workers "—J D BERNAL, J R S, *New Statesman and Nation*, Aug 5, 1939, p 211

FRACTURES

THE ORGANISATION OF TREATMENT

More than a million and a quarter injuries are treated each year in the hospitals of Great Britain, and of these about 200,000 are fractures. Although there is no means of estimating the cost to the community of these accidents, it must run into many millions of pounds. In 1937, for example, the cost of compensation under the Workmen's Compensation Acts was estimated at about £13,000,000: and only about a third of all fractures are due to industrial accidents.

Though prevention is preferable, rapid and complete cure will minimise the loss suffered by the injured man and less directly by the community. It is here that surgery must take responsibility Unfortunately the treatment of fractures is often inefficient and recovery is slow and incomplete. No-one would deny this and a remedy must be found.

The final report of the Interdepartmental Committee for the Rehabilitation of Persons Injured by Accidents [1] is an interesting and valuable document. Although the terms of reference of their inquiry include all kinds of injuries, the committee have in the main concentrated on the treatment of fractures. At the same time they think that once an efficient fracture service has been established it will naturally attract to itself many allied conditions such as severe lacerations and sprains and injuries of the hand and fingers It should exclude, on the other hand, injuries to the head and abdomen, for these are better treated by specialists in cranial and abdominal surgery: the committee are opposed to a comprehensive traumatic service.

FRACTURE SERVICES

By far the most important recommendation in the report is that special fracture services (or clinics) should be set up throughout the country and that they should be based on three principles:

(1) All fractures (except those of the head) should be segregated in a single department, which would provide for both inpatients and outpatients.

(2) The service should be operated and controlled by a single team under a surgeon in charge.

(3) The treatment should be continued until the fullest possible restoration of working capacity has been attained.

The accommodation required is discussed in detail and plans are given of two recently erected fracture clinics. The items include a "shock room" for the immediate treatment of seriously injured cases, an X-ray department with a portable apparatus, a department for physiotherapy and remedial exercises, and an efficient system of records

The personnel centres in the surgeon in charge, and if the clinic is established at a voluntary hospital he should preferably be a member of the visiting staff with a special interest and experience in the treatment of fractures. It is suggested that he should receive a fairly substantial honorarium (say £500 a year in a hospital of over 500 beds) for the special and onerous duties he would undertake. The amount of time he would have to give to the fracture service would considerably reduce his opportunities for more remunerative work and some compensation would be essential if the best man is to be obtained He would be permanent and he would personally control and supervise every stage of the patient's treatment, thus ensuring the coördination and continuity which are essential in an efficient fracture service Under him would be one or two whole-time assistants of the standing of registrars, besides resident house-surgeons There would be close coöperation between the fracture service and the orthopædic department.

RESTORATION OF FUNCTION AND HEALTH

Treatment should continue until the fullest possible functional recovery has been attained. The importance of the early stages of treatment, the accurate reduction and immobilisation of the fracture, is not underrated in the report, but it is the next stage, the restoration of function, that is considered in most detail, for it is in this stage that the present system of treating fractures is held to be most seriously defective. Although physiotherapy, such as massage and electrical treatment, may play a valuable part, active movements of the muscles and joints are of greatest importance and are best carried out under supervision in some kind of gymnasium.

There are several reasons why these remedial exercises should be done at the clinic In the first place they can be supervised, which is the only way to ensure their being done properly. Secondly, the example of other patients and competition with them are useful stimuli. And thirdly, the patient is away from his home, where conditions are often depressing and the cause of anxiety and discouragement. He should be made to consider his efforts towards recovery as a whole-time job, and should spend as much time at the clinic as possible Later may come the question of light work A job created merely to keep the man occupied is not good enough Too often light work exercises every member except the injured one. The surgeon in charge should satisfy himself that the work is of the kind the man requires to complete his recovery and should see him from time to time at the clinic until he can do full work. In some cases when a man's work is heavy he may need a course of general reconditioning, even though the function of the injured limb has returned to normal. Such cases should be few if efficient treatment has been given at a clinic with adequate facilities, but when they do arise it is suggested that the physical-fitness centres which are being established under the National Fitness Campaign might meet their requirements. The London Midland and Scottish Railway already have at Crewe an establishment which does excellent work of this sort Every effort should be made to abolish the dangerous interval sometimes intervening between the patient's discharge from treatment and his resumption of full work For those cases where permanent disability incapacitates a man from following his old occupation, a vocational training centre might be established by the Ministry of Labour to train him for some other work

The report also deals with the psychological factors influencing recovery from the effects of an accident The fracture service can have little direct control over some of these, but there is general agreement that the efficient treatment of the patient in an organised fracture department will go a long way to prevent some of these abnormal mental states arising A lot can be done by suggestion, through the surgeon in chief and his assistants, that complete recovery is to be expected as a matter of course, and in a successful clinic the high proportion of rapid and complete

1 London: H M Stationery Office 1939 Pp 194 3s 6d

recoveries will speak for itself Financial worries and the anxieties and difficulties connected with compensation are often a cause of emotional mischief, and although they are fully and sympathetically discussed in the report no final solution is suggested As a royal commission has been appointed to consider the whole question of workmen's compensation the committee make only one recommendation in this connexion—namely, that a man should continue to receive compensation as for total incapacity so long as he is under treatment at the fracture service unless he has been found suitable light work and is earning wages

Some of the troubles that beset an injured man and may retard his recovery can be mitigated by the good offices of an almoner's department for instance, the home conditions can be inquired into and distress relieved by drawing on some appropriate fund, extra nourishment for the patient or his family may be provided where it is found to be needed, and if he cannot afford his fares to and from the clinic help may be found The almoner may also do very useful work as an intermediary between a man and his employer, by helping to solve such problems as the securing of suitable light work, or perhaps by obtaining an assurance that work will be found on recovery

WHAT SHOULD BE DONE NOW

The committee recommend that steps be taken now to establish fracture services in all parts of the country Schemes should be worked out in consultation between the local hospital authority (i e, county or county borough council) and the representatives of the voluntary general hospitals, and it is strongly recommended that a standing joint committee of the two bodies should be set up for this purpose Other interests, such as the local bodies representing the medical profession and the organisations of employers and workers, should also be consulted Where a full fracture service cannot be established at once it is recommended that temporary provisional arrangements be made which secure the main principles of a fracture service The important thing is to get started

Capital expenditure will sooner or later be necessary in the institution of fracture services, and the report suggests that this should be met by the benefactions of public spirited individuals and general public support To help to meet the cost of maintenance it is proposed that the local authority should make an annual subvention In addition the limits imposed by the Road Traffic Act on the amounts that may be recovered by a hospital for treatment of road accident cases should be abolished, and also the approved societies might make a larger contribution by way of additional benefits, to hospitals that establish adequate fracture services

Their inquiry convinced the committee that the training of medical students in the treatment of fractures is, in general seriously deficient and that a period of training in the fracture department should be made an obligatory part of the curriculum Various suggestions were considered for applying this recommendation one or two of the six months set aside for inpatient surgical dressing might be devoted to attending the fracture and orthopædic departments, or, if it was considered undesirable to shorten the period of general surgical dressing then the course on fracture training would have to be fitted in elsewhere The fracture departments would also provide excellent facilities for postgraduate study and refresher courses

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENT)

VOLUNTARY HEALTH INSURANCE

From July 20 to 22 representatives of associations which provide medical care on a prepayment plan met in New York Among these associations were groups described by Dr Hugh Cabot as "producer-coöperatives" (such as the Ross Loos clinic in Los Angeles and the Trinity hospital group at Little Rock, Arkansas) and "consumer-coöperatives" (such as the group health association of the home owners' loan corporation in Washington, D C) The numerous industrial medical organisations were not represented This was the first meeting of all the voluntary health insurance experimenters The difficulties of organising for group practice under existing state laws, and the opposition of organised medicine to this type of experiment, were discussed General applause greeted Dr I Goldman of Yale when he stated that while abuses do exist under all insurance systems, including those of England, France and Germany, the danger of abuses had been greatly exaggerated and could be met by proper organisation When turnover was discussed, the group health association in Washington described how there are regularly 25 members each month transferred from the government service or from the city of Washington Dr Michael Shadid of the farmers union coöperative hospital association, Elk City, Oklahoma, said that in his experience there was no turnover, since the hospital at Elk City is owned by the farmers of Oklahoma, who are fully conscious that the interests of the coöperative are their own

An encouraging feature of this conference was the presence of speakers who considered simply the ideal of good medical practice Prof John P Peters described forcibly the ever increasing acceleration of the potentialities of medicine combined with the poor record of these potentialities being realised "The medical profession," he said, "congratulates the system of individual competitive practice for the high estate of medical science in this country In actual fact the practitioner is playing an ever-diminishing rôle on the productive side of medicine The new diagnostic and therapeutic procedures which he employs and the apparatus which he operates emanate more and more from full time salaried workers in educational institutions research organisations or commercial firms Often enough the inventors have not even a medical degree The physician is being relegated to the position of distributor and technician" He warned his hearers that medical groups must not develop on department-store or repair shop principles, if this happened, their doctors would sink to the level of clerks and technicians Groups must be organised so as to attract men with high intelligence and education, and offer them opportunity for continuous intellectual development The group clinics had an opportunity both to provide exemplary medical care and to give the staff opportunities for educational growth

The organisation of an ideal medical group was also discussed by Dr Hugh Cabot, until recently of the Mayo Clinic The most essential member was the man who was called in America an "internist" Dr Cabot felt that if there was an internist there must also be an externist, and so the most satisfactory thing was to reclassify the internist a "good general physician" This man should add up the observations of all the specialists and consider them as a whole Whether

or not all patients should be shown to the specialist depended upon the kind of specialist employed It was a waste of time to let the expert with a microscopic mind review all cases Every group should include experts in the special senses, in surgery, and in dermatology and roentgenology. Good medical care must be based upon preventive medicine They were still making faces at syphilis and not doing so much more satisfactorily than they were twenty years ago. Good medical care must enable the sick to have at their disposal the whole machinery of modern medicine. It was improbable that more than 10 per cent. did get care of this kind. Good medical care could not be got as long as doctors' incomes depended upon providing it. There were three fields of knowledge involved in group medicine: sociology, economics and the scientific practice of medicine. Capable representatives in these three fields must be consulted For forty years Dr. Cabot had insisted upon a yearly report from each of his students. They had asked him, "Where is this practice of medicine you told us about?" Their elders who were under oath to look after them saw to it that the young man got no chance to work. They needed the services of youth with its energy and idealism, and they would not get good medicine as long as the emphasis was on age, experience and whiskers

At the concluding session it was agreed to form a national association which will hold its first regular meeting in Chicago next year.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE SCOTTISH CHILD'S INTELLIGENCE

A STUDY of child intelligence in Scotland has been occupying the Scottish Council for Research in Education for the last two years, and their report has just been issued. Three groups were studied: the first from the four major cities, the second from the industrial belt, and in the third from predominantly rural districts On the Binet tests the mean intelligence quotient for the total sample of children was 100 11. Boys showed a mean quotient of 100 51 and girls 99·7, a difference which is not regarded as statistically significant. A slightly lower level was found in the children of the industrial districts compared with those of the urban and rural groups The average level in rural children is not inferior to that of the city children. It is felt that the remarkable uniformity of educational opportunity which has been achieved in Scotland must have had an influence on the development of intelligence in areas where environmental conditions might otherwise tend to create a lower intelligence level Performance tests were also studied and here again the lowest mean level of ability was found in the industrial belt, but on these tests the city children were found superior to the rural children. A definite sex difference on the performance tests was apparently due to a slower rate of development of ability in girls than in boys Equal results were obtained at the age of 8 or 9 years but thereafter boys became increasingly superior.

INCAPACITY AMONG SCOTTISH INSURED POPULATION

Miss Muriel Ritson, controller of insurance and pensions, stated last week that there were over 26,000,000 days of incapacitating sickness from June, 1937, to June, 1938, in the insured population of Scotland. This figure was slightly lower than that of the previous year, but it was for a year in which no influenza epidemic occurred. Of the lost days 11½ million were accounted for by 31,000 men and women who were sick throughout the year. It was known that the main causes of long-term disablement were diseases of the nervous system, bronchitis, valvular disease of the heart, rheumatism and tuberculosis. Scotland had a long and honourable record of measures for combating disease and raising the standard of health, but so long as there remained such a mass of chronic and disabling disease among the living they must not rest satisfied. In the prevention of long-term illness greater stress must be laid on the factors concerned in building a healthy body rather than in patching it up when ill health appeared Social workers could not but wonder how the stress and strain of the present anxious times would affect the health of the peoples of Europe. It would be a bold prophet who would forecast the results of this so-called "war of nerves."

DENMARK

(FROM AN OCCASIONAL CORRESPONDENT)

GASTRIC AND DUODENAL ULCERATION

DURING the last few years perhaps the two subjects most prominent in Danish medicine have been pneumonia and gastric and duodenal ulceration Pneumonia has attracted attention because of serotherapy and chemotherapy, and gastric and duodenal ulceration because of the recent remarkable changes in the frequency and sex distribution. The interest taken in this subject in Copenhagen has spread to the provinces, and in the town of Aarhus Dr. A. Guldager and Dr. F. Heintzelmann have reviewed the incidence of manifest ulcer hæmorrhages in the 20-year period 1918–37 To make their comb-out as complete as possible they scrutinised the records of the municipal hospital A study of 341 cases of manifest ulcer hæmorrhage shows a striking increase in the condition This seems to be exclusively due to the greater tendency of males to develop gastric and duodenal ulceration, with hæmorrhages. During the period studied the increase in admissions to the medical wards of this hospital was proportional to the increase in the town's population in the same period, whereas the number of patients suffering from ulcer hæmorrhages was more than quadrupled. At the beginning of the same period men and women were equally liable to ulcer hæmorrhages, whereas at the end the ratio was four to six men for every woman This sex discrimination most unfavourable to the male is still unexplained.

SERUM TREATMENT OF PNEUMONIA

For those who, like the Danes, have thrown themselves heart and soul into the campaign for serum treatment of pneumonia, there is something tantalising and almost exasperating in the diversion created by chemotherapy. The possibility that Prontosil may be a red herring or an ally rather than a competitor of serum treatment is comforting the workers at the Danish state serum institute There since 1935 Dr. T. Madsen, its director, has created a special department for examining sputum, typing pneumococci, producing serum, and researching into the serology of pneumonia This work is obviously important, since the average case-mortality from pneumonia in Denmark has for some years been about 20 per cent. and during the 15 years

ending 1936 there have been about 10,000 deaths in Denmark from croupous pneumonia alone, irrespective of bronchopneumonia

The pneumococcal rabbit serum issued by the state serum institute and now in general use in Denmark has been found to be quite as effective as horse serum, and a dose of 200,000 units now costs only about Kr 40, whereas the price for the same quantity used to be about Kr 350 The concentration of the serum has been increased so that now there are 4000 to 6000 units in every c cm The serum is in most cases given intravenously rather than intramuscularly The results, as shown by a recent study of Dr N I Nissen, have been quite encouraging His material has consisted of 932 cases of pneumonia in which serum was given The *mortality of 13 5 per cent* might well have been reduced for window-dressing purposes had he allowed himself the luxury of weeding out several fatal cases in which the serum treatment was not given a fair trial

FATE OF LUPUS PATIENTS

Dr C N S Gundtoft has inquired into the causes of death of patients who had attended the skin department of the Finsen Institute in Copenhagen during the past 25 years He collected information about 211 such cases His findings suggest that the patient who suffers from lupus vulgaris runs little chance of dying of this disease, but he has a fifty-fifty chance of dying of some form of tuberculosis The deaths ascribed to lupus itself numbered only 10 But there were as many as 61 patients who had died of pulmonary tuberculosis, and 33 who had died of some other form of tuberculosis, such as tuberculous meningitis As for the non tuberculous causes of death, malignant disease was the most important, being responsible for 24 deaths This is in itself a testimony to the benign character of the lupus which allowed its victims to attain a high enough age to become subject to malignant disease Pointing in the same direction were the 8 cases in which the cause of death was said to be *senile decay* Dr *Gundtoft* draws attention to the great frequency with which pulmonary tuberculosis broke out shortly after treatment of lupus was started, he suggests that in these cases the lupus had been the cutaneous manifestation of an already serious though still latent pulmonary tuberculosis The late Dr Reyn, formerly chief of the Finsen Institute, was among the first to emphasise the importance of a tuberculosis background in the lungs and elsewhere of patients who at first sight seemed to be suffering from lupus and nothing else

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations Each contributor is responsible for the section for a month, his name can be seen later in the half-yearly index

FROM DOCTOR DON

III

EVERY time I revisit London I rejoice that I no longer live there Somewhere about 100,000 appears to be the maximum size to which a town can grow and remain a coördinated social organism Beyond that level its membership becomes as irrational and irresponsible as a swarm of locusts or lemmings When people are condemned to live in Hoxton or Clerkenwell or one of those amorphous areas around Wembley or Penge, it is almost impossible for them to feel local patriotism or to take an active part in the life of the community The women's institutes have developed so vigorously in the villages that they have become a power in the land, but the health centres and community centres in the towns languish and seem unable to stand by themselves The picture palace the billiard-room and the by pass road are poor substitutes for the parish pump and the village hall and largely in consequence Hog's Norton is months ahead of London or Birmingham in A R P Dwellers in the Harley Wimpole Street area develop a sentimental attachment to St Marylebone but I lived there for five years without knowing the names of the mayor the town clerk or any of the borough council, and I am sure this experience is not unique

In medicine London has become the great *Wasserkopf* with hundreds of consultants and thousands of consultoids I have always deplored and fought against this over centralisation, though it is probable that the specialist must follow the crowd as the salmon follows the herring shoal It is a bad thing that the *Wasserkopf* should dominate clinical education as it does by historical prestige, weight of numbers and proximity to the Royal Colleges Few teaching physicians in London have many friends outside their own profession and fewer still work actively alongside scientists, humanists or industrialists The state of affairs is quite different in places like Aberdeen, Edinburgh or Oxford In Aberdeen, for example, with the Rowett Institute and the fishing industry looming so large, it is natural that clinical teaching should be permeated with the importance of nutrition and industrial hygiene London clinical teachers are preoccupied with technical matters of interest to the guild, such as the differentiation of subarachnoid bleeding from cerebral hæmorrhage or the separation of coronary thrombosis from angina of effort, and they are less likely to stress really significant things which are new but not easily incorporated in their craft, such as the facts that a high carbohydrate diet requires more vitamin B, or that compensation tends to increase the incidence of the disability compensated The cynic cannot but observe that the deification of London applies not at all to the fundamental sciences

In surgery also famous schools have recently flourished outside London—in Edinburgh, Leeds and Newcastle, for example It is internal medicine and related subjects such as pediatrics and psychology which have received excessive representation in London and this suggests to me that as at present practised they are luxury trades The state of affairs in America and Germany where there are many university schools of equal prestige, is much healthier and the whole time or semi whole time clinical units in the Scottish universities in Manchester, Cambridge and Oxford, may restore British medicine to a better condition For highly trained physicians to do much of the pettifogging work that is done in the Harley Street area is as if the president of the Royal Society was employed at mending old ladies' wireless sets It is perhaps no worse than the tradition in music where artists of the calibre of Hindemith may give lessons for fees and cannot very well pick and choose their pupils, but it links medicine with the seamier side of the arts I was going to say that medicine

should be more of a priesthood; but the church has been commercialised for centuries and bishops more commonly celebrate marriages in Westminster than in Wigan.

* * *

The sixty-mile journey to London takes little over an hour and the time passes pleasantly enough. For the two-mile journey from Paddington to the Royal Society of Medicine the bus requires twenty minutes and a succession of stops, but this allows me to study the most important section of Oxford Street and the crowd which throngs it. The concourse of women busy about nothing impresses me with one of the less favourable aspects of the rise in the standard of living. Seen from the top of a bus one must perforce regard them as a herd or group and criticise them on the basis of the opportunities they have had and the æsthetic pleasure they provide. The poets have stated that they are less beautiful than the animals and with this one cannot but agree. Nor can they compare with the crowds in clogs and shawl against whom I jostled on the streets of South Lancashire thirty years ago. Those women were rude and coarse but they expressed vitality and they wore a local costume or industrial uniform which enhanced the looks of the pretty and made the whole group attractive. The outburst of sympathy for Gracie Fields expresses a nostalgia for a day which has gone since Mrs. Deeds came to town. To see an attractive crowd today one has to travel to Ireland or to the Mediterranean—somewhere in fact where poverty still reigns.

It is curious that women who pass so much of their time gazing in shop windows and spend a big proportion of their income on clothes should make such a bad job of it. The colours are drab, there is no sense of form, and the lines of hat, neck-line, waist and skirt clash in a way that the most amateur student of composition would avoid. Skirts are either too long or too short, and high heels throw the silk stockings in wrinkles or make the calf muscle unpleasantly prominent. Hair has improved in the last two years as bobbed hair has grown a little longer but is still too often either frivolous or frowsy. Finally, modern outdoor dress for women is exceedingly unkind to those—and they are the majority—in whom the contours have begun to sag. An Indian woman in her sari, however old her face or form, appears in this crowd like a songbird amidst the sparrows.

I will not deny that the area between Marshall and Snelgrove and Dorville reveals some better lookers, but these are largely young saleswomen and buyers whose face is their fortune. Moreover the last thing I grumble at is that women are attracted by pretty things in shops. I read *Vogue* regularly and I appreciate the thrill women get out of colours, surfaces, textures, furs and jewels. It is not the expense which is lamentable but the result. About the only dress in which a crowd of women looks really attractive today (and remember I am thinking of them as groups and not as individuals) is the semi-nude of the bathing beach, the tennis-court and evening dress. Allow them more liberty and they become fussy or dowdy. Access to the materials and markets of the world has been as bad for the modern woman as for the modern builder, and women's dress today is as depressing to look at as the new estates they live in. I do not believe the average crowd of women will ever look attractive unless their dress freedom is confined within narrow limits, but until we can provide the right amounts of Norman Hartnell and compulsion, the promenaders in Oxford Street will continue to be unprepossessing and I on top of my bus will sigh for the attractive crowds of Kos and Rhodes.

When I look into the faces of these women, I feel that very few of them have "laid hold on life" in the words of the hymn tune or are keeping themselves in intellectual or spiritual training. Behind them I see the English middle-class home. No account of trench warfare makes the reader feel its boredom, and no play, film or novel sufficiently stresses the insipid quality of English bourgeois life. With the decline of child-bearing and of religious interests the field of consciousness has narrowed at the same time as the amount of leisure has increased. The day passes with aimless chatter as to why Mrs. X has changed her window curtains, what year Princess Y had her operation, whether the latest child-murderer has a kind face, and the like. Much of the discussion leads to bickering and rouses emotion out of all proportion to the context, for the atmosphere is charged with unutilised energy and any little lightning conductor attracts the storm. All those trivialia and tempers are stamped on the faces of the Oxford Street women. And so let us leave them to get back to their jerry built homes.

* * *

I really do not know why I pay fifteen guineas a year to a club when I usually lunch at the Royal Society of Medicine, close to my books and journals. The creation of the Royal Society of Medicine out of a group of pre-existent societies impresses me as one of the greatest feats of our time; and if any survive of those that worked that miracle, I should like them to know that we of a younger generation bow down and call them blessed. For the Royal Society of Medicine is undoubtedly as efficient, obliging, useful and comfortable an institution as any man could hope to belong to.

* * *

But I must hurry off to my committee, which, after all, is the nucleus round which the rest of the day's activities cluster. It is customary and of course easy to regard committees as the bane of professional life. This is partly because they are not called board meetings, attendance at which is handsomely rewarded, but it is even more because they are so often inefficient at their work. Hospitals cannot function or laboratories be built without some mechanism for pooling the knowledge and advice for their direction, but the method of representative government commonly followed in colleges and hospitals, where every fellow, or everyone who is in charge of beds or head of a department, is on the committee, is fundamentally wrong. A college does have the advantage of a permanent president, but the chairman of a hospital committee is commonly appointed on grounds of seniority rather than efficiency. When I have seen a hospital committee solemnly discuss whether the charlady should retire on pension at 55 or 60, or a college meeting with an attendance of nearly forty fellows, whose time must be worth at least 15*s*. an hour per head, waste half an hour deciding whether the catalogue of college plate should be duplicated or printed with pictures, I have realised only too clearly why democracy has failed in so many countries.

The Medical Research Council, with a highly skilled permanent secretariat, an independent chairman, a limited membership of experts with regular retirements and replacements, and a large number of specialised subcommittees of a purely advisory nature, seems to me a model which might be more widely copied

There is no medical or paramedical organisation in the country which spends £250,000 a year with greater wisdom or profit With the development of joint hospital boards and hospital amalgamations important committees have swollen to gigantic size, and they should now regard themselves merely as a folk moot which will create a new instrument of government and then disband I have said elsewhere that most medical schools would do well to have their organisations overhauled at intervals by a business psychologist or efficiency expert and I am sure that the trend is towards smaller executive committees with greater authority, more employment of junior staff on advisory committees, more whole time administrative personnel, and the disappearance of the idea of a committee as a soviet or a place to blow off steam

* * *

Blackham's amusing article sets me wondering why the applied physiologists, who are so happy for an excuse for a trip abroad, have never taken up the study of sea sickness They have dwelt on Pikes Peak and with sulphur miners on the high slopes of the Andes, they have raced their mules in the torrid deserts of Mexico, they have heard the avalanches roaring down Everest and the ice cracking at the Poles, but I do not remember ever to have read of an expedition to study sea sickness Of course it would be difficult to do laboratory experiments beforehand, for everyone seems to agree that behaviour in the Barany chair has little to do with a life on the rolling main Nor does there seem to be much to measure, for though a series of papers on the *Electrolytes of the plasma, the sweat and the vomit in sea sickness* or *Audiometric tracings in the prevertiginous stage of morbus maris* might look well in my department mental report, they would merely add to the literature and not lessen the burden of sea sickness And then there is the horrid psychological factor

So it is clear that it is no use applying to the applied physiologists, and our ship must be manned by men of robuster breed, the clinical experimental therapeutists We believe that it can be quite a profitable occupation to put drugs of which we know little into bodies about which we know still less, provided we follow certain general rules, which are now pretty clearly established It often requires a great deal of moral courage on the part of both patient and investigator, as is clearly shown in Murphy's account of the discovery of the liver treatment of pernicious anæmia Mainly by these methods we have found that nitroglycerin relieves angina, theophyllin-ethylenediamine relieves periodic breathing, adrenaline asthma, ergometrine migraine, and phenobarbitone and diphenylhydantoin relieve epilepsy, and we believe that by the same methods we shall find a symptomatic cure for sea sickness nocturnal enuresis, colon spasm, chorea, and most other manifestations of this type, perhaps before we know what is happening to the cholinesterase or the catalase gradient in them We finally believe that we shall creep back into the fold under the label of chemotherapeutists now that empiricism is once more in fashion So if anyone will supply me with a boat of 15,000 to 20,000 tons, and about 300 passengers who have been bribed by cheap cruising rates to agree to accept when necessary special diets, drugs and routine ward procedures, I shall be very happy to organise an expedition to study sea sickness On our first trip we shall probably go north, as it sounds rough north of Cape Wrath (though I believe the name really means the turning point), and in any event I have always wanted to see Greenland's icy mountains

PUBLIC HEALTH

ADVANTAGES OF CENTRALISATION IN THE HOSPITAL TREATMENT OF FEVERS

BY DUNCAN FORBES, M B L, M D Edin, D P H
LATE MEDICAL OFFICER OF HEALTH FOR BRIGHTON

PRIMARILY fever hospitals were built to provide for the *isolation* of patients, for it was hoped in this way to control the spread of such diseases as scarlet fever and diphtheria Just as the exclusion of home contacts with measles fails to prevent the spread of the disease throughout infected schools, because the chief sources of infections are the large numbers of school contacts who develop and spread the disease, so the isolation in hospital of scarlet fever and diphtheria patients has failed materially to affect the incidence of these diseases, because the chief causes of spread are the overlooked case and the carrier who freely mix with their fellows Further, patients nursed with others not only run a risk of contracting diseases such as measles and chickenpox, but often have their period of infectivity prolonged for instance a large proportion of cases of scarlet fever acquire other strains of hæmolytic streptococci which render them more highly infectious on discharge than home nursed patients The chief function of the fever hospital therefore, is no longer the isolation but the efficient treatment of the patient, including the prevention of cross infection during his stay in hospital

The public, influenced by the fear of the spread of infection, did not grudge the capital cost of fever hospitals because they regarded, and still regard, the isolation of these dangerous patients in hospital as of primary importance to the common weal Unfortunately they have not the same interest in the cure of the individual patient in hospital, and although it has been proved that to prevent cross infections the present large undivided wards should be supplemented or replaced by smaller ward units and cubicle wards, local authorities are loth to expend money for the provision of these They are equally backward in the provision of efficient medical treatment for the patients

EFFICIENCY IN TREATMENT IN LARGE AND SMALL HOSPITALS

It is not surprising therefore to find great variations in the standards of treatment possible of attainment in fever hospitals There is no doubt that higher standards are maintained in the large fever hospitals provided, for instance by the London County Council and the large county boroughs There we have medical superintendents in charge who give their whole time to fevers and who are assisted in their work not only by a resident medical staff and a highly trained nursing staff but also by visiting consultants Patients are seen by a doctor in the ambulance or receiving rooms before admission, doubtful cases are properly isolated and all patients are at once given appropriate treatment including

the *intravenous* injection of antitoxin in most cases of diphtheria.

Compare this with conditions in a small fever hospital in charge of a matron who sees the patients on admission. Later she telephones the doctor in charge who gives instructions and prescribes treatment on the matron's report. If the patient is severely ill the doctor pays a special visit as soon as he finds it possible, the moderate and mild case may not be seen until his next routine visit. Administration carried out on these lines is likely to lead to disastrous results from time to time In diphtheria, for instance, antitoxin is usually administered *intramuscularly* by the matron. This leads to a great lengthening of the interval between the admission of the patient and the entrance of antitoxin into the blood-stream, regardless of the fact that each hour's delay increases the danger of subsequent paralyses and may even mean the difference between recovery and death When we consider that, to ensure the earliest possible entry of antitoxin into the blood-stream, general practitioners are advised not to await a swab result before notification, and that patients are admitted at any time night or day, such delay in, or omission of, *intravenous* injection on the admission of the patient seems inexcusable. Again, even if the non-resident doctor hurried to the hospital to be ready to treat on admission the occasional case of diphtheria, he might find difficulty in giving an intravenous injection to the young child with an abundance of subcutaneous fat. After the closure of the fontanelle it may be necessary to cut down on a vein or to give an intraperitoneal injection, and these methods being unfamiliar may not be adopted. In any case success is more likely to attend the resident physician who treats large numbers of cases in a large fever hospital

Passing to another matter, supervision and treatment by the specialist, for instance in middle-ear disease, are more easily arranged and more conveniently carried out at the large well-staffed and well-equipped hospital.

These are but examples which could be multiplied, as the whole administration of the fever hospital is now highly specialised as to treatment, nursing, and isolation. No-one with a knowledge of the subject doubts that, broadly, the larger the hospital is, the more highly qualified the medical staff, the better the facilities provided and the higher the standard of treatment.

GROUPING

Under section 63 of the Local Government Act, 1929, and section 185 of the Public Health Act, 1936, county councils have had surveys made and have submitted for approval to the Ministry of Health schemes which should have ensured adequate provision for the isolation and treatment of persons suffering from infectious disease Such schemes were made after consultation with the component authorities and, when necessary or when deemed advisable, with county boroughs As the Ministry of Health was in favour of infectious diseases being treated in central hospitals, of a size which would constitute efficient and economical self-contained units, serving reasonably large areas, and as most county medical officers were of a like opinion, it no doubt was the aim of the latter to concentrate treatment in a few large rather than in a great many small hospitals Their difficulty was "to reconcile the individual and often conflicting claims of the several isolation hospital authorities in the county, so that the best use might be made of the existing accommodation."[1] It was still harder for the county medical officer of health, with any hope of success, to suggest a general closure of small hospitals and the establishment of a large central hospital, even when he recognised that such a procedure would lead to greater efficiency in treatment and in the long run to economy. Likewise it was not a simple matter to have any large number of beds reserved in the relatively large county-borough fever hospitals unless the county council agreed to pay the cost of the additional accommodation required The result is that progress has been slow and there still remains a multiplicity of small fever hospitals, although the earlier average of some 40 beds has no doubt been increased to a small extent

AREA WHICH CAN BE CONVENIENTLY SERVED BY A FEVER HOSPITAL

In the days of the horse ambulance and indifferent roads, distance was a serious matter In a well-sprung motor ambulance 30 miles can now be covered in an hour with no discomfort to the patient. There is no reason, therefore, if otherwise convenient, why a centrally situated hospital should not serve an area of 2700 square miles or more Naturally if it were decided to centralise treatment the largest hospital in any area would be selected, and its accommodation increased as required and brought up to date The smaller hospitals closed for fever work could often be used in a conjoint scheme for other purposes, as continuation hospitals, or for convalescents, tuberculosis, orthopædic cases, rheumatic hearts and even for overflows from the central fever hospital at peak periods in infectious disease incidence. Practical experience shows that parents have no serious objection to the removal of fever patients to a distance, so long as they are kept informed of the patient's progress and are asked to visit if the patient is dangerously ill The very fact that the patients were drawn from a wide area would minimise, although it would not overcome, the difficulty of staffing due to the continuously varying incidence of infectious disease[1] In this connexion I find that, taking an area, including boroughs and urban and rural areas, with a population of over 400,000, the number of notifications over a period of eight years was at peak periods for scarlet fever 2½ times, and for diphtheria 3 times, the average, whilst for a town of 150,000 the peak figures for both scarlet fever and diphtheria were 4 times the average

The following figures show the number of notifications in 4-week periods for the larger and smaller populations mentioned above.

NOTIFICATIONS IN 4-WEEK PERIODS

	—	Over average	Average	Under average	Maximum	Minimum
A	Scarlet fever	27 (113)*	1 (71)	63 (44)	180	19
	Diphtheria	31 (32)	4 (18)	56 (9)	57	2
B	Scarlet fever.	31 (41)	4 (22)	56 (11)	95	2
	Diphtheria	32 (16)	7 (8)	52 (4)	43	0

A = Population, 400,000, B = 150,000

* The figures in parentheses show the average number of notifications in the periods named, thus there was an average of 113 notifications in each of the 27 weeks when scarlet fever was over the average

It is evident from these figures that, whether the population be large or small, there will tend to be rush periods alternating with longer periods of under-occupation and over-staffing. Such difficulties are more easily overcome in the large hospital with a sufficiency of cubicle blocks and varying sized wards,

1 See the fifteenth report of the Ministry of Health, p 67.

quite apart from the lesser variations in the number of notifications in the larger, compared with the smaller, populations served

The Departmental Committee on the Cost of Hospitals, in its final report, states that to provide a small (fever) hospital with the full equipment and facilities appropriate to a large one would be unduly costly, and that it is hoped that, by coöperation on the part of local authorities, the erection of very small isolation hospitals in the future will be avoided

HOW REFORM CAN BE ATTAINED

If it is agreed that the small fever hospital with no resident medical staff should be closed when possible, how can this desirable reform be attained? What can be done for instance in the case of a county borough with a combined sanatorium and fever hospital of 170 beds requiring the addition of cubicle blocks to bring its accommodation up to date? A fever hospital of 50 beds is situated within some four miles, and four other fever hospitals of 28, 18, 12 and 12 beds serve areas within a reasonable distance, none of these five hospitals have a resident medical officer Can we hope that the county, the county borough and the other authorities concerned will grasp the urgent need for centralisation of fever work in the relatively large county borough hospital, will get together, and, within the next two or three years, agree on a scheme for the centralisation of their fever work? Only the confirmed optimist would answer in the affirmative Whilst some good work has been done under section 63 of the Local Government Act, 1929, and section 185 of the Public Health Act, 1936, progress is slow and is not of the radical nature required, the reforms carried out still leave, unclosed for fever work, large numbers of small fever hospitals with not even one resident medical officer The history of the last ten years proves that the present unsatisfactory arrangements for the efficient treatment of fevers will be continued indefinitely unless greater powers be given to the Minister of Health it should be made incumbent on him to review the position, to revoke earlier schemes when such appears desirable and to insist on concentration of work in larger units with resident medical staffs In short, he should be able to formulate schemes to ensure the greatest efficiency in treatment in any particular area Failing additional powers he could refuse to approve schemes which did not provide adequate treatment in so far as they included small hospitals without a resident medical officer

In recent times a great deal has been done to rationalise various industries with a view to increased efficiency and the lowering of working costs, and effective pressure is being brought to bear in cases in which desirable amalgamations have not been made voluntarily Surely the same principles could be applied to our present fever hospitals with a view not only to economy but to the better treatment of the patients

A COMBINED MUNICIPAL AND FEVER HOSPITAL

Now that patients suffering from pulmonary tuberculosis and orthopædic patients have been nursed in fever hospitals without bad results, the question has been raised as to whether the fever hospital could not form a part of the municipal hospital In this connexion it has to be remembered that the nurses in fever hospitals must be protected against diphtheria, scarlet fever and the enteric group, that children in the orthopædic wards must be protected against diphtheria, that nurses from any particular fever ward should not mix freely with the nurses from other wards, and, when they are transferred from fever wards to duty in other wards, steps should be taken to ensure that they are not carriers Thus shows that the addition of fever wards to the municipal hospital would add to the difficulties of the medical superintendent and matron and might have serious results when these officials were not thoroughly versed in fever administration The resident medical officers in charge of the fever wards might at times have no special fever experience and be out of touch with the health office staff The plea has been made that fever wards in slack times could be used to relieve crowding in the general wards, but a moment's consideration is enough to convince one of its futility except to get over a temporary difficulty until new accommodation is provided Taking all these matters into consideration it would seem that the disadvantages of the combination of the municipal and fever hospitals far outweigh its advantages

EXPEDIENTS JUSTIFYING THE APPOINTMENT OF A RESIDENT MEDICAL STAFF

In cases in which the number of beds in a fever hospital fails to justify the appointment of a resident medical staff, the difficulty may be overcome in the following ways The number of beds can be increased by the building of wards in the fever-hospital grounds for the nursing of tuberculosis and orthopædic patients The municipal laboratory may be established at the fever hospital and sputum swabs and bloods, sent by general practitioners, examined there General practitioners may be invited to call out the senior resident medical officer to see or consult regarding doubtful cases, and at times the senior medical officer may be attached to the staff of the medical officer of health and put in charge of fever work generally Such expedients are worth while when the medical officer of health cannot otherwise obtain a resident medical staff for the fever hospital

CONCLUSION

The primary object of these notes is to emphasise the need for the more efficient treatment of the fever patient which can only be effected by the centralisation of fever work in large units with a resident medical staff To attain centralisation in a reasonable time additional powers and duties must be assigned to the Minister of Health

The position is well summed up in the report of the Committee on Scottish Health Services, 1936, as follows "The small infectious disease hospital providing for only the three diseases—diphtheria, scarlet fever and enteric fever—is now regarded as obsolete, with modern transport facilities it is not longer necessary except in a few areas, it cannot provide the facilities for treatment that modern knowledge demands, and in relation to its effectiveness it is uneconomic"

Smoke Abatement

A draft order has been prepared by the Ministry of Health extending the list of noxious and offensive gases and works covered by the Public Health (Smoke Abatement) Act 1926 Copies of this draft order may be seen at the Ministry of Health or purchased through the Stationery Office A public inquiry will be held on this order by the Ministry's chief inspector of alkali and other works at the Ministry of Health on Sept 1 at 11 A.M. Any interested person may attend and give evidence

LETTERS TO THE EDITOR

OXYGEN IN CORONARY THROMBOSIS

SIR,—In your issue of Aug. 5 Dr. Poulton writes on oxygen therapy in coronary thrombosis. At Passavant Memorial Hospital, Chicago, whilst I was there in 1934–36, it was and had been a routine, under Dr. M Herbert Barker, to use the oxygen-tent in treating this condition We found administration through the forked nasal tube too often impracticable because of the patient's restlessness, and therefore abandoned it. In using the tent it was very important at the outset to explain to the patient what was being done and why, and in some cases extreme restlessness made even its use impossible We found it necessary to use high concentrations of oxygen but we never exceeded 60–70 per cent Another point of great importance was the careful control of the carbon-dioxide concentration and we estimated both the oxygen and carbon-dioxide content of each air sample. Long continuous periods in the tent were essential and one could only judge when it was safe to remove the patient by gradually lowering the percentage of oxygen in the tent at the end of 5–7 days, and noting the effect on the patient I am convinced that the intermittent giving of oxygen is valueless. To do all this it is imperative to have an "oxygen service" such as they have at Passavant Too often failure is attributed to the oxygen rather than to the operator.

The relief of the pain, cyanosis and restlessness—especially the latter—was dramatic, as is noted by Dr. Poulton. I agree with him that this country is unfortunately suffering from oxygen-lack.

I am, Sir, yours faithfully,

THOMAS SIMPSON.

Cheshire Joint Sanatorium, Market Drayton, Salop, Aug 9

LEAD LYING DORMANT?

SIR,—In your last issue you have a report of an inquest headed with the words "lead lying dormant?" It is the note of interrogation which prompts this letter During the last war, when stationed in a district largely populated by C.3 men, one saw a very large number of cases of acute lead colic in men who had been free from such symptom for many years Some of these narrowly escaped removal of their appendices. More interesting still were the cases of acute anæmia, paresis, and so forth, in quite young men whose occupations exposed them to the risk of lead poisoning and whose symptoms seemed to have been occasioned by the unusual physical exercises involved in army life In both classes of case it seemed impossible to doubt that lead had been lying dormant, only to be brought back into circulation by military service.

I am, Sir, yours faithfully,

Sevenoaks, Kent, Aug 12 GORDON WARD.

BIOPSY OF THE ENDOMETRIUM

SIR,—From your interesting leading article last week one gains the impression that biopsy curettage in this country is an innovation, and mention is made of the uterine aspirator described by Lorincz and Davis this year (*Brit med J.* 1939, 1, 261)

There is no doubt at all that the so-called office technique, using a small biopsy curette, is an invaluable aid to the correct administration of hormones for menstrual disorders or sterility, and a saving in time and money to the hospital Such biopsies have been carried out by me in the outpatient department of the Royal Infirmary, Bristol, since the end of 1936, using a suction curette designed by myself (*Lancet*, 1937, 1, 698) or a still more simple curette designed by Sharman and Sheehan (*Brit med J* 1937, 1, 965) By the use of these biopsy curettes excellent pieces of endometrium can be obtained for section, and for all but the most nervous patients with no anæsthetic of any kind; they can go home immediately without any discomfort

This method of diagnosis of ovarian activity should be more widely appreciated by gynæcologists Considerably more sections of endometrium, obtained at a sensible time in the cycle, would give valuable aid to the endocrinologist and would vastly simplify the pathology and physiology of the endometrium to the pathologist, who should also be supplied with a detailed menstrual history.

I am, Sir, yours faithfully,

Bristol, Aug 12 GEORGE L FOSS

PHYSICAL METHODS IN RHEUMATIC DISEASE

SIR,—I am not surprised to read Dr Troup's letter in reply to the report by Sir Leonard Hill, F.R.S., and myself published by the Empire Rheumatism Council. No doubt all the methods we criticise are in use and no doubt also they will be hotly defended by their users Herein lies the key to the unfortunate position which physical medicine occupies today. The system of testing and approving (or otherwise) of apparatus to be used for physical treatments carried out by the physical-medicine committee of the American Medical Association is one that cannot fail to recommend itself to those who have the welfare of this subject in mind.

I am, Sir, yours faithfully,

H. J. TAYLOR

Empire Rheumatism Council, Alexander Maclean Laboratory, Ranelagh Road, S W 1, Aug 14

THE NIGHT-BLIND AIR-RAID WARDEN

SIR,—I was on duty during the black-out, and encountered, like all other A R P. workers, the difficulty of doing my job in a darkness that seemed very nearly complete It seemed to me however—and this is the point—that seeing in the dark was much more difficult than it had been during last winter when taking country walks at night At that time I was taking the normal winter precaution of a course of halibut oil But I had discontinued that for about five months before the black-out, when I found my night vision, apparently, so poor

What I want to know is—was the deterioration in my eyesight only a subjective impression, or are there real grounds for the story that halibut oil improves the capacity to see in the dark? If the latter, then we of the A R P. ought certainly to take appropriate action.

I am, Sir, yours faithfully,

Aug. 15 AIR-RAID WARDEN

*** Night-blindness and sluggish adaptation to changing states of light and darkness are associated with deficiency of intake or absorption of vitamin A, and should be cured or alleviated with cod liver oil or halibut-liver oil To quote from our own columns, M. K Maitra and L J. Harris found that only 40 per cent of 200 elementary-school children in Cambridge and the east of London showed normal dark adaptation, compared with 90 per cent. of public school boys; but deficiency was less evident as age increased, for none of 38 mothers bringing children

to a school clinic were definitely subnormal, and 18 out of 22 healthy adults were normal in adaptation (*Lancet*, 1937, *2*, 1009) N T Gridgeman and H Wilkinson (1938, *1*, 905) tested about a hundred healthy adults and thought that some 30 per cent were subnormal The improvement on taking vitamin A did not, however, seem very great C Vaillant and L Gillis (1939, 1, 149) record a case of severe night blindness cured with vitamin A though the patient's diet appeared normal —ED L

THE PROBLEM OF MEDICAL LITERATURE

SIR,—In 1807 Sir John Sinclair, famous father of the Board of Agriculture, published in four volumes his "Code of Health and Longevity," undertaken, as he said, to ascertain "how far it was practicable, to condense and systematize human knowledge, concerning any particular branch of science, the necessity of which, is becoming every day more apparent" On Sinclair's plan, science was to be divided into its different branches and for each division "an intelligent person" was to analyse all that was published on it Collections were to be made of the writings of every author, whether ancient or modern, who had written either directly or indirectly on the matter in question, and all valuable observations were to be abstracted and digested by "an able person with a committee of assistants" A concise summary was to be translated, at the expense either of the Government or of a society established for the purpose, into all the principal languages of Europe Such a work would then be regarded as a code (hence the title of Sir John's book on longevity) to which all future publications regarding it must refer

"Unless some such mode, of arranging and condensing human knowledge, is fallen upon, the world will be overwhelmed with a load of literature, without deriving, in any degree, that advantage from it which might otherwise be obtained Indeed, in its present state, knowledge may be compared to a small portion of gold, dispersed throughout a great quantity of ore In its rude condition, the strongest man cannot bear its weight, or convey it to a distance, but when the pure metal is separated from the dross, even a child may carry it without difficulty"

I am, Sir, yours faithfully,

Aug 11. Dr PANGLOSS

OBITUARY

RICARDO JORGE

M D

Professor Jorge, whose death on July 31 was recorded in our last issue, won his international reputation by his work on the major epidemic diseases, notably on plague, typhus and yellow fever, on which he was the acknowledged successor of Carlos Chagas He was born in 1858, and after studying medicine in his native town of Oporto soon made his mark—not without much opposition but with the active support of Camera Pestana—by his campaign against plague, indigenous in Portugal until late in the nineteenth century A number of brilliant studies, including the epidemic of the "zaire," from which emerged new light on the prophylaxis of cholera, made his name known across the frontiers of Portugal, and his appointment as director general of public health widened the field of his activity He represented his country on the International Health Office, Paris from 1912, when Portugal ratified the Rome agreement of 1907, continuously until his death His first report to it was on undulant fever and since then have followed a long series of reports, monographs and communications in discussion duly reported in the Monthly Bulletin of the Office on a wide range of communicable diseases and on the problems that confront the practitioner and the administrator called upon to treat and to prevent Of many examples, bearing witness to his ability and erudition may be cited his contributions to the study of pellagra, his classical analysis of the relation of alastrim (variola minor) to smallpox his description of an outbreak of Weil's disease in Lisbon traced to a rat infected fountain and his review of encephalitis following

vaccination, published in our own columns in 1932 But he was happiest when engaged in the study, and, especially in his later years, in the historical research into his two favourites, plague and yellow fever On yellow fever, of which he had seen much in Portugal and in Brazil where he worked with Chagas, he was an acknowledged authority The later "jungle" type of that disease, however, caused in him much perplexity of mind and he never could quite accept the evidence and the hypotheses on which this new form and conception of amarillic infection were based He could swallow, up to a point, evidence of the presence of the virus as shown by the mouse-protection test, and of an amaril like infection demonstrated by liver section post mortem, but he could never quite satisfy his instincts and his desire for clinical evidence of the recognised signs, symptoms and high mortality of true yellow fever, so often absent in the so called jungle variety of that disease Consequently, the spread of the virus in recent years throughout Brazil, and the discovery of an alleged case at Wau in the Sudan and later at Malakal, disturbed him, and to the end he was not converted Nor (it must in fairness be said) are all his colleagues On plague it suffices to recall the following contributions from his pen "The rôle of rodents and fleas in the conservation and transmission of plague," "Sylvan plague and its distribution in Africa," and lastly his '*Summa epidemiologica* of the knowledge of plague'

Besides representing Portugal at the Paris Office, Ricardo Jorge was an original member of the health committee of the League of Nations on which he was appointed in 1923 The many demands of his work as *director general of public health in Portugal* did not prevent him from acquiring renown in matters national and cultural His supple intelligence ranged over a large variety of subjects in art, literature the etymology and science of language, philosophy and history and he has been compared with the savants of the Renaissance—encyclopædists to whom nothing was unknown His works on Greece are celebrated He revealed and recalled by his studies the grandeur of the Portugal of the seventeenth century, particularly by those on Rodrigues Lobo By his history of

research he dissipated and refuted the many calumnies surrounding the life and death of Jean II. In contemporary affairs he was an ardent and sincere admirer of England and English institutions. He held, and expressed, often in international debate, in so forcible a manner as to embarrass his English colleagues, that England and Englishmen were the birth-place and founders of hygiene, and to them only was due all that was worth while in the promotion and development of the public health.

Small and frail in stature, the gentlest and the kindest of men, Ricardo Jorge seemed to his associates, in these modern times, something ethereal, like a fine piece of old porcelain

FRANK ROMER
M.R.C.S.

Frank Romer was born in 1871, the fifth and youngest son of Sir Robert Romer, senior wrangler, chancery judge, and chairman of a royal commission on hospitals He was educated at Sherborne where he won his rugger "cap" Later he played rugger for Middlesex: his caps always hung in his consulting-room and at his request were buried with him. He trained at St George's Hospital and after qualifying commenced general practice at Malmesbury in Wiltshire While there he injured his back when hunting and became a patient of the late Mr. Wharton Hood, the first medically qualified "bone-setter." Romer was so impressed with Wharton Hood's work and methods that he joined him in partnership, and after Wharton Hood's retirement continued the practice and specialised in this branch of treatment With great rapidity his work increased, his success being due both to his enthusiasm in developing the treatment of injuries along his own lines and also to his possessing a truly wonderful pair of hands His ideal was the earliest possible restoration of function to the injured part, this he achieved by immobilisation for the shortest possible period, encouraging early movement and commencing massage at the beginning of treatment He held strong views as to the type of massage to be employed and trained his own masseuses in his own methods. He also devised many forms of remedial exercises to meet individual cases His methods were his own—unorthodox in many cases, but often crowned with success.

[Lafayette

During the war he was medical officer on the late Earl of Dunraven's hospital yacht, the *Grainaig*, which evacuated casualties from places as distant as the Near East While visiting an injured sailor on a destroyer in a rough sea he injured his right leg and was transferred to shore, becoming specialist at the military hospitals of Edgbaston, Croydon, and Millbank in his own line of work His system of medical gymnastics and his method of treatment of injuries brought him into contact with Robert Jones and began a friendship which was of benefit to both After the war he became consultant surgeon to the Jockey Club and the National Hunt and was honorary surgeon to the College of Music and the Booksellers' Benevolent Society. He was also an officer of the Order of St. John of Jerusalem.

Romer was both versatile and talented He painted some delightful water-colours of racehorses and also executed some good models He wrote extensively and well, not only medically, but also racing novels His charm and vivid personality made him countless friends, and in the Bath Club, a favourite haunt, he had the affection of both members and staff Indeed the annual golfing dinner with Frank Romer in the chair was always a very happy evening—almost an institution Though his latter years were marred by constant suffering and many operations on his leg, culminating in amputation, he was never known to grumble at fate, and sitting in his wheel-chair he carried on cheerfully with his work to the last

HERBERT JAMES
C.B., C.M.G., O.B.E., F.R.C.S., D.P.H.

Colonel James, who died on Aug 9 at Gilston, Southern Rhodesia, was the last of three distinguished brothers. Sydney, the eldest, at one time headmaster of Malvern, was archdeacon of Dudley, Montague, the youngest, was provost of Eton from 1918 till his death in 1936. The father of this distinguished trio was the Rev Herbert James, rector of Livermere, Suffolk.

H. E. R. James was born in 1857 and received his medical education at Charing Cross He entered the R.A.M.C in 1882 and served in it until his retirement in 1908 After this he was attached to the general staff at the War Office for training medical units of the officers' training corps, until his final retirement on account of age in 1922 During the Sino-Japanese war of 1894–95 James was attached to the Chinese army and awarded the Double Dragon of China for services to the Chinese wounded From 1914 to 1918 he rejoined the active list and served in Egypt and Salonika in command of a general hospital

James was an outstanding figure in the R.A.M.C After two years as secretary to the commission of reorganisation of the army medical services after the South African war, he was appointed first commandant and director of studies at the Royal Army Medical College, on its move from Netley to Millbank in 1902. He served in this capacity for six years, and by his tact, courtesy and kindly disposition he became a friend for life to his students His active brain, his learning, his knowledge of men and affairs, and a stern sense of discipline helped him to make an enduring success of the college in its new surroundings There are many senior officers of the R.A.M.C, both regular and territorial, who owe much to the training, advice and sympathetic help which they received in their young days from Bertie James

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DR JAMES FREDERICK EDMUND BRIDGER, who died on Aug 8, was born on March 31, 1875, and educated at St. Mary's In 1905 he became health officer to the colonial government of Barbados For a while he was superintendent of the Pelican Island smallpox hospital in Barbados, and then port medical officer. He was thus naturally chosen to be a member of the Barbados government commission which investigated the quarantine system of the port sanitary authority of New York. He also sat on a commission to report on an epidemic of eruptive fever at Port of Spain, Trinidad. Later he was translated to Ceylon where he became director of medical and sanitary services, and also principal of the Ceylon medical college. He retired from the colonial medical service in 1930.

INFECTIOUS DISEASE

IN ENGLAND AND WALLS DURING THE WEEK ENDED AUG 5, 1939

Notifications—The following cases of infectious disease were notified during the week Smallpox, 0, scarlet fever, 1508, diphtheria, 775, enteric fever, 24 (59 "expected"), pneumonia (primary or influenzal), 308, puerperal pyrexia, 178, cerebro-spinal fever, 21, acute poliomyelitis, 16, acute polio-encephalitis, 4, dysentery, 41, ophthalmia neonatorum, 100 No case of cholera, plague, or typhus fever was notified during the week

The number of cases in the Infectious Hospitals of the London County Council on Aug 11 was 2623 which included Scarlet fever, 635, diphtheria, 498 (carriers 16), measles 15 whooping cough, 652 puerperal fever, 13 mothers (plus 7 babies), encephalitis lethargica 303, poliomyelitis, 16 At St Margaret's Hospital there were 13 babies (plus 4 mothers) with ophthalmia neonatorum

Deaths—In 126 great towns, including London, there was no death from smallpox or enteric fever, 5 (0) from measles, 2 (0) from scarlet fever, 6 (3) from whooping-cough, 14 (1) from diphtheria, 21 (3) from diarrhœa and enteritis under two years, and 6 (0) from influenza The figures in parentheses are those for London itself

Fatal cases of diphtheria were scattered over 11 great towns, Middlesbrough Southport and Walsall each reporting 2 Birmingham had 3 deaths from diarrhœa Barking, Liverpool, Manchester, Sunderland and Nottingham each 2

The number of stillbirths notified during the week was 214 (corresponding to a rate of 34 per 1000 total births), including 30 in London

MEDICAL NEWS

University of Glasgow

A short course of lectures on some recent advances in ophthalmology will be given on Tuesdays from Sept 5 to Oct 10 at 4.30 P M in the Tennent Memorial Building, 38, Church Street, Glasgow Prof A J Ballantyne will discuss problems of vision in aviation at the first lecture and radiodiagnosis and radiotherapy at the last Other speakers will include Dr John Marshall (problems of blindness—causes and prevention) Dr I Chesar Michaelson (pressure problems—ocular, cerebral and circulatory), Prof A Löwenstein (the eye and nervous diseases), and Dr A M Wright Thomson (ocular therapeutics) The lectures are open to all who are interested

Preventive Paediatrics

The seventh congress of the Association Internationale de Pédiatrie Préventive will be held in Lausanne from Sept 22 to 24 *The main subjects for discussion will be* prophylaxis of physical and mental disorders in puberty, and maternal and infant welfare in rural areas Further information may be had from Dr D Oltramare secretary of the association 15 rue Lévrier, Geneva

Billeting in Brief

A summary of the Government evacuation scheme for children, with hints to householders who would be called upon to care for other people's children is given in a pamphlet, 'Billeting in Brief' just issued jointly by the National Union of Teachers and the Save the Children Fund, price 2d In it the authors have summarised information in the Government publications and have added some sensible hints on diet, playtime, spots, temperatures and the like

Madras Medical Council

Cases of advertisement by registered medical practitioners in the law press and by means of handbills have lately been reported to the council At a meeting on April 17 the council therefore decided to warn practitioners that all such advertisements—including even the opening of private institutions, inviting lawyers to attend such functions and the reporting of these functions in the law press—will be considered as contravening section 6 of the warning notice published by the council and will be dealt with accordingly

International Congress of Hydrology

The sixteenth Congrès International d'Hydrologie, de Climatologie et de Géologie Médicales will be held at *Strasbourg from Oct 8 to 13 Further information* may be had from Prof Vaucher, Institut d'Hydrologie thérapeutique et Climatologie, 1, Place de l'Hôpital, Strasbourg

International Congress of Gastro-enterology

The Société Internationale de Gastroentérologie will hold its third congress next year in London from July 14 to 18 Sir Arthur Hurst will preside and the chief subjects for discussion will be the relationship between diseases of the blood and gastric diseases, and regional ileitis Further information may be had from Dr Thomas Hunt, 49, Wimpole Street, London W 1

Medical Diary

Aug 21 to Aug 26

PADDINGTON MEDICAL SOCIETY
TUESDAY—9 P M (Town Hall, Paddington, W 2), Case Problems in General Practice

EDINBURGH ROYAL INFIRMARY
THURSDAY—5 P M Dr R G Gordon Emotional Disturbances as a Cause of Physical Disorders (Honyman Gillespie lecture)

Appointments

ASHFORD, HAZEL I M.D Edin, D P H assistant medical officer for maternity and child welfare for Burnley

CLARKE, ELIZABETH M R, M B Dubl, L M, D T D, assistant school medical officer for Burnley

GRAHAM, E W M B Edin. D P H medical officer of health for Stowmarket urban district, Gipping and Samford rural districts, and assistant county medical officer for East Suffolk

HOLT, R L, M D Manc, F R C S hon assistant surgeon to the Manchester Royal Infirmary

McBURNEY, W S, M B Belf assistant school medical officer for Stoke-on-Trent

PAYTON, G O, M D Birm M B Edin D P H, medical officer of health for Stourbridge

RATCLIFFE, T A, M B Camb D P M, D C H senior assistant medical officer at the City Mental Hospital, Nottingham

ROBERTS, MORRELL M D D Sc Manc M R C P clinical pathologist to the Manchester Victoria Memorial Jewish Hospital

ROBERTSON, DAVID M D Glasg, consulting psychotherapist to the Harrogate and District General Hospital

Colonial Service—The following appointments and promotions are announced—

GRAY, N M B medical officer West Africa

LAWSON, F L M B Dubl, medical officer Uganda

LEE, S W F M D Belf, D T M D P H D O M S, senior medical officer in charge Zanzibar

MAYSON BAHR, P F C, M B Camb, M R C P medical officer Tanganyika Territory

NEVIN, H M, M B Dubl, D T M D P H, pathologist, Penang

ORENSWORTH, U F, M D Berne district medical officer Bahamas,

TOWLINSON, P M B medical officer Malaya and

WISENGRAVE, J W, M D St And D.M.R.E radiologist Singapore medical service

London County Council—The following appointments and promotions are announced A.M.O (I) or (II)—assistant medical officer class I or II;—

BROWNRIGG, E K M R C S A M O (II), St Luke's Chelsea;

DOWDLEY, I W, M B Lond, A M O (II) St Pancras

EASON, T J M B Edin, F R C S A.M.O (I) New Inf

EVANS, HILDA M M R C S D P H an assistant medical officer on the central medical staff of the public health department

EVANS, W J S M B Aberd A M O (II) Hackney

INGRAM, C W J M D Dubl divisional medical officer on the central medical staff of the public health department

JONES, O B M B N Z, A M O (I), Bethnal Green

LIDDELL, R W M B N U I F C S I A M O (I) St James's

NICHOLSON, JOHN M B Glasg A M O (II) Hackney,

PARKER, F G M M B Lond A M O (I), Bethnal Green

PARKER, I F M D A M O (II) Queen Mary's, Sidcup

EVANS, W G M D Lond M R C S, medical superintendent

WRIGHT, A J M D Lond F R C S I M R C O G part time obstetrician and gynæcologist to the casualty and special staffs at Lambeth Hospital and

YEATES, J M, M D Sydney A M O (I) Queen Mary's Carshalton

Vacancies

For further information refer to the advertisement columns

Abercrave Workmen Medical Committee —Medical practitioner
Accrington, Victoria Hosp —H S , £175.
Bath, Royal United Hosp —Hon anæsthetist
Bedford County Hosp —Third H S , at rate of £150
Birmingham, Canwell Hall Babies' Hosp —Res M O , at rate of £250
Birmingham Children's Hosp.—Res surg. O., £175 Also asst. res. M.O. and asst pathologist, £125
Birmingham, St Chad's Hosp —H P and anæsthetist, at rate of £150
Brighton, Royal Alexandra Hosp for Sick Children —H S , £150
Brighton, Royal Sussex County Hosp —Two H S 's, £150
British Postgraduate Medical School, Ducane Road, W 12 — Cas O , at rate of £150 Also two H S 's, each at rate of £105
Cardiff, King Edward VII Welsh National Memorial Assn — Area asst tuber officers, each £500 Also two asst res M O 's for Sully Hosp , each £200
Central London Ophthalmic Hosp , Judd Street, W C 1 —Sen and jun H S 's, £200 and £150 respectively
Colchester, Royal Eastern Counties' Institution, &c —Med supt for Bridge Home, Witham, £750
Dorking County Hosp —Res asst M O , at rate of £250
General Lying-in Hosp , York Road, Lambeth, S E 1 —Jun res M O and anæsthetist, at rate of £100
Glasgow Corpn —District medical officer, £600
Gloucester, Gloucestershire Royal Infirmary —H S to ear, nose, and throat dept , at rate of £170
Greenwich, Metropolitan Borough —Asst M O , £500
Grimsby County Borough —Asst M O , £500
Hounslow Hosp , Middlesex —Hon. physician for physiotherapeutic dept.
Hull Royal Infirmary —Second H S , at rate of £150
Ilford Borough —Asst dental surgeon, £450
Kingston County Hosp , Surrey —Res asst M O (anæsthetist) at rate of £250
Leicester Royal Infirmary —Resident appointments
Lincoln County Hosp —Hon anæsthetist and two hon asst physicians
Liverpool City Infectious Diseases Hosp —Res asst M O 's, £250
London County Council —Asst M O 's Class I and II, £350 and £250 respectively
London Hosp , E 1 —First asst and registrar to ear, nose, and throat dept , £150 Also surgical first asst and registrar, £300
Manchester, Barnes Convalescent Hosp —Res jun M O , at rate of £150
Manchester, Park Hosp , Davyhulme —Res obstet officer, £400
Manchester and Salford Hosp for Skin Diseases —H S , at rate of £150
Manchester Royal Infirmary —Two jun. asst. M.O.'s in radiological dept , each £350.
Middlesbrough, North Riding Infirmary —Sen H S , at rate of £175
National Temperance Hosp , Hampstead-road, N W 1 —Cas O , at rate of £120 Also H P , at rate of £100
Newcastle-upon-Tyne, Barrasford Sanatorium —Res med asst , £250
New Zealand, Wellington Hosp Board —Orthopædic registrar, £500
Northampton General Hosp —Res cas O , res anæsthetist, also res H S to ear, nose, and throat dept , each at rate of £150
Northumberland County Council —County M O H and school M O., £1200
Norwich, Jenny Lind Hosp for Children —Hon asst surgeon to orthopædic dept Also Res M O , £120
Norwich, Norfolk and Norwich Hosp —Hon asst orthopædic surgeon
Nottingham Children's Hosp —Res H P , at rate of £150
Nottingham City Mental Hosp —Jun. asst M O , £475 or £350
Oxford, Radcliffe Infirmary —Res surg O., at rate of £150 Also H P 's and H S 's, each at rate of £100
Pembroke County War Memorial Hosp , Haverfordwest —Res. H S , £200
Prescot, Whiston County Hosp —Res surg O , £400
Preston and County of Lancaster Royal Infirmary —Res obstet officer, £350 Also cas H S , at rate of £150
Prince of Wales's General Hosp , N 15 —Res jun H P and H S.'s, each at rate of £90
Queen's Hosp for Children, Hackney Road, E 2 —H P and ear, nose, and throat H S , each at rate of £100 Also physician for whooping-cough clinic, 1 guinea per attendance
Queen Mary's Hosp for the East End, Stratford, E 15 —Res M O and cas O , each at rate of £150 H S and H P , each at rate of £120 Also obstet H S , at rate of £110–£130
Redhill County Hosp , Surrey —Res asst M O , at rate of £250
Royal Cancer Hosp , Fulham Road, S W 3 —Res H S to radium dept , also H S , each at rate of £100
Royal College of Physicians of London —Milroy lecturer
Royal Naval Medical Service.—Medical officers
Salford City —Asst clin tuber officer, £500
Salisbury General Infirmary —H S , at rate of £125
Samaritan Free Hosp for Women, Marylebone Road, N.W 1.— H S , at rate of £100.
Sheffield, Jessop Hosp for Women —Res M O , at rate of £150
Southampton, Free Eye Hosp —H S , at rate of £150
Stoke-on-Trent City —Asst M O for maternity and child welfare, £500
Swansea County Borough —Asst M O , £500
Warwick, King Edward VII Memorial Sanatorium, Hertford Hill —Jun asst. M O , at rate of £250.
Weir Hosp , Weir Road, Balham, S.W 12 —Jun res M O , £150
West Ham County Borough —Two R M O 's at Whipps Cross Hosp , £350
West London Hosp , Hammersmith, W 6 —H P and H S , each at rate of £100 Also genito-urinary surgeon
West Riding of Yorkshire County Council —Asst bacteriologist, £650
Wigan, Royal Albert Edward Infirmary and Dispensary — Pathologist and bacteriologist, £500
Willesden Municipal (Fever) Hosp , Neasden, N W 10 —Res M O , £250
Wolverhampton County Borough —Temp asst M O H , £600
Woolwich and District Hosp. Assn., Shooters Hill, S E 18.— H S. and cas. O , at rate of £100.
York County Hosp —H P , £150.

The Chief Inspector of Factories announces a vacancy for an examining surgeon at St Blazey, Cornwall

Births, Marriages and Deaths

BIRTHS

CALTHROP —On Aug 5, at 23, Upper Wimpole Street, W 1, the wife of Dr G T Calthrop—a son
CLEGG —On Aug 10, the wife of Dr W B Clegg, of Bishop's Castle—a daughter
HARRIS —On Aug 5, at 11, Alexandra Park Road, N 10, the wife of Dr. J S Harris—a son.
JAMES —On Aug 5, the wife of Dr Eric James, of Solihull, Warwickshire—a son
KELLY —On Aug 9, the wife of Dr J O Kelly, of Lanark—a daughter
LEECH —On Aug 9, at Mengo, Uganda, the wife of Dr R Bosdin Leech—a daughter
LLOYD —On Aug 7, at Aldeburgh, Suffolk, the wife of Dr W Jeaffreson Lloyd—a daughter
LODGE —On Aug 8, the wife of Dr John Lodge, of Edinburgh —a son
WOODGATE-JONES —On Aug 13, at 19, Bentinck Street, W 1, the wife of Dr N P Woodgate-Jones—a son
YARDLEY —On Aug 8, the wife of Dr G E Yardley, of Windsor—a son

MARRIAGE

MILLER—BOWER —On Aug 12, at St John's Church, Hyde Park Crescent, William Archibald Montgomerie Miller, M B , to Dorothy Mary Bower

DEATHS

BOWIE —On Aug 13, at 17, Sydney Street, Chelsea, S W 3, Albert William Bowie, M B Edin , L M
BRIDGER —On Aug 8, at Balladoyle, Slinfold, Sussex, James Frederick Edmund Bridger, M.B Lond , formerly director of medical and sanitary services, Ceylon, aged 64
JAMES —On Aug 9, at Gilston, Salisbury, S Rhodesia, Herbert Ellison Rhodes James, C B., C M G , O B E , F R C.S., lieut -colonel R A M C (retd)
MCCONAGHY —On Aug 9, at Camberley, Christopher Birdwood McConaghy, M B Edin , lieut -colonel I.M S (retd)
WATTS-CLARKE —On Aug 13, at 23, Kelsey Park Road, Beckenham, Richard Edward Watts-Clarke, M B Edin

N B —A fee of 7s 6d is charged for the announcement of Births, Marriages, and Deaths

THE LANCET 100 YEARS AGO

August 17, 1839, *p.* 743

Clinical remarks, by Sir Benjamin Brodie

OPERATIONS.—When I was a young hospital surgeon I entertained a very exalted idea of operative surgery, and thought very highly of the great importance of *immediately* performing an operation whenever it might seem to be required I have had much experience, however, since that time, and I now think that some little circumspection should be used beforehand, . . . You should consider well what the effect of an unsuccessful operation will be upon the minds of society at large, for every surgical operation that fails prevents two or three persons from submitting, in cases where the use of the knife might be successful This caution is required at once on behalf of ourselves, of society, and of our art Do not, then, always operate when you will by no means be sure of success . . . And at all times inquire into the state of the general health Learn if the patient be a drunkard or a free liver; and if so, beware I knew a lady of fashion, who got drunk every morning, and died from the puncture of a small encysted tumour Women of high rank are very nervous and hysterical Persons in whose families mania may have existed are bad subjects for operations They sometimes die afterwards in a very strange manner—with some very unusual symptoms

NOTES, COMMENTS, AND ABSTRACTS

PRINCIPLES OF MEDICAL RESEARCH

THE DUAL CAREER

BY LORENZ S MICHALLIS, M D Berlin, L R C P E

CLINICAL ASSISTANT IN THE ORTHOPÆDIC DEPARTMENT, ST JOHN CLINIC LONDON

IN two previous articles [1] I have given examples of what seem to be fundamental obstacles to the progress of medical research First, the real limitations of highly specialised research have been ignored, thereby leading to a series of wrong conclusions Secondly, in a different field, traditional limitations have been unjustifiably accepted as permanent, thereby seriously hampering our search for the causes of disease By deducing these two conclusions, which sound so severely theoretical, from practical examples, I hope to have made it clear that it would be worth while trying to stop these erroneous principles from acting as guides in the future To define them is one thing, to prevent them from continuing to exert their misleading influence another The right way to achieve *this lies, in my opinion, in postgraduate education* It is here that we have to search for the origin of the present lack of cohesion in medical thinking of the uncertainty in applying logic to biology, and of the ever-widening gap between clinical and laboratory research

Does not postgraduate education now tend to make the young medical Odysseus an expert in negotiating either Scylla or Charybdis instead of teaching him how to sail his ship properly in all waters? Is there not too much temptation for the ambitious man to stop his ears early with the wax of specialist diplomas in order to escape the Sirens' island of broader interests? And, having once used the wax for this purpose, does he not often forget ever to remove it, remaining professionally deaf for the rest of his life?

THE NEED

There are three groups of recently qualified men for whom postgraduate education has to be provided The first and largest consists of those who more or less immediately engage in practice, to which they are naturally inclined and in which they form an essential part of medical activity The second much smaller group contains a number of exceptionally gifted people, whose gifts are such as to drive their owners irresistibly in one direction, be it surgery or physics, radiology or biochemistry

Here we are concerned with a third group the size of which is more difficult to judge It might well be much greater if members of the first group were shown its possibilities It is the group of keen and gifted men who find themselves caught in the current of competition for practice appointments or degrees before they have had time to try and see, not only whether they belong to group 1 or 2, but whether they could not combine some of the essentials of both careers and thus build one of their own At present there is no official recognition of these

A few in this group have found a solution for themselves often at the cost of severe financial strain and many disappointments Their research work, which has not made them prisoners of their specialty, has been looked on by orthodox research specialists as amateurish and their clinical achievements have been met with distrust by clinicians on account of their "theoretical speculations."

It is, however, no accident that among them are some of the best brains and most successful explorers in medical research Their progress on the professional ladder may have been slower than that of pure specialists, but their grasp of the problems of both clinic and laboratory is swifter and more certain because of their real experience in both spheres Should not their pioneer efforts be used as a guide for mapping out a new third way of postgraduate education? This way would have to lie between practice only and theory only, between clinical research and its laboratory rival It would have to combine the essentials of thought and technique of both sides, and would have to include actual work in both spheres for a period long enough to gain real experience and yet short enough to make a "dual career" possible

The need for such a third way is greater today than ever, not only because of the bewildering growth of specialism but still more because of the need for a great number of young workers to shoulder the task of research into cancer, rheumatism and nutrition This need is comparatively new, it calls for a new, or at least an officially new, principle in postgraduate education for research

TRAINING FOR THE DUAL CAREER

The present system of medical education in this country has produced overwhelming proof of its efficiency in fitting the general practitioner and the specialist for his job, and I am not here suggesting that the organised study available for groups 1 and 2 should be altered I do suggest, however, that additional provision should be made for group 3

The young doctor would be free to choose a two years' course either in a laboratory or in the wards of a hospital After this period he would have to produce proof of research done in either sphere under the supervision of the head of the department This work, which would not necessarily have to be a paper for publication, would be taken into account for his higher degree, part of the examinations for which would be replaced by it Whether entirely new degrees were instituted or existing ones modified would not matter as long as the degrees were made equal to other higher qualifications

Having passed the examination on his first two years' work the doctor should next spend a year on the opposite side—at a hospital if his degree was gained on laboratory work and vice versa At the end of this period, during which he would again have to carry out research, he should be able to take a second degree or pass a second part of the first examination, the quality of his research again being taken into account Now he would be free to decide whether to go on with research, and if so whether in the laboratory or in the hospital or whether to go into practice

Practical research in both fields would in this way become part of the early experience of a large number of men who were to spend their lives in the laboratory, the hospital or in practice There would be fewer of that type of research-worker who has never seen a patient and for whom he need hardly exist, and less contempt for the "rabbit monger" on the part of the practical man for whom nothing exists but the patient

During these three years the young doctor should hold either junior house appointments, the number of

[1] *Lancet* 1939 i 186 and 856

which would have to be increased, or correspondingly paid junior posts at laboratories, the facilities of which would have to be extended The expense of this expansion of research should be borne by the pooled resources of the medical schools, postgraduate colleges and research organisations, all of which would ultimately gain from the raised standard and increased quantity of useful work done.

PART-TIME RESEARCH INSTITUTES

On this basis of an officially recognised third path to work and distinction the "dual career" should be carried further by providing special facilities for clinical and laboratory research for those who have done their three-year period of research training and hold the new degrees While earning their livelihood either in a practical field or as permanent members of a laboratory team they must be able to maintain contact with the "other side" and continue as part-time research-workers.

To provide opportunities for work in the wards for members of laboratories should not be difficult The provision of facilities for part-time research would require the setting aside of space, equipment and technical assistance Since this new type of work might interfere with the routine of existing whole-time research, an independent research institute should be founded for it Here expert directors would supervise research done by the part-time men, who would attend, say, twice a week for two hours according to a strict time-table.

Such an institution, once established with the help of the pooled resources of the interested bodies and gifts from donors, would form the centre of a medical research society, which might become a research section of the Royal Society of Medicine. The contributions of its members should cover part of the running expenses, but the fees should not be so high as to prohibit gifted but less prosperous men from taking part. Here the growing number of young helpers in medical research would find opportunities for active collaboration, without having to wait for one of the few openings now granted them The centralisation of work at special institutes would allow research efforts to be directed into channels where they are most needed, and would avoid much of the present overlapping Such organisation would also be a safeguard against the danger that a fall in the quality of research would accompany an increase in its quantity.

SUMMARY

Additions to the existing system of postgraduate education might help (*a*) to eliminate early over-specialisation and consequent lack of a balanced judgment in questions of research; and (*b*) to provide the qualified collaborators needed for research into cancer, rheumatism and nutrition

A "dual career" should be open to the young postgraduate, based on a three years' course in theoretical as well as clinical research.

New or amended higher degrees would be instituted, in which the value of research work done under supervision would be taken into account

The holders of the new degrees would be given adequate facilities to continue as part-time research-workers at an institute specially designed to give them access to equipment and technical assistance as well as expert advice and coördination.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—The office and library of this association will be closed from Aug 21 to Sept. 11.

RED CROSS

UNDER a plain title ("Story of the British Red Cross." London: Cassell and Co 1938. Pp. 275 8*s.* 6*d*) Mr. S. H. Best tells a romantic tale in plain words. It was at the start of the Franco-Prussian war that Lord Wantage and Sir John Furley first conceived the idea of a National Aid Society and from it soon developed the British Red Cross Since then there has hardly been a page in the annals of war on which it has not figured prominently Up till the great war the society's organisation was limited, and August, 1914, found it occupying a small office in Victoria Street, without funds but with definite plans for dealing with the conflagration its organisers had foreseen Its activities in every seat of war do not need recapitulation; to express them in terms of cash, the society had raised £17,000,000 by the end of the war. Like all pioneers it had to fight for its existence, and though many of its schemes were hailed with scorn—the V.A.D organisation for example—they lived to justify themselves triumphantly.

Mr. Best gives little space to the post-war activities of the society, but his description of its work in Abyssinia and especially that among sufferers from mustard-gas should be read by anyone who doubts the efficacy of gas as an instrument of torture to the unprepared. He says little of the part played by the society in the blood-transfusion services or in air-raid precautions, and does not mention Spain. But there is enough to enthral anyone who cares for human and humane activities

TREASURE TROVE

THE inquest last Monday upon the remarkable find of gold and silver articles discovered in the Anglo-Saxon ship burial at Sutton Hoo, near Ipswich, ended in a verdict that the articles were not treasure trove. The evidence of archæological experts, interesting as it was, could hardly be needed to establish that the precious objects were deliberately and publicly placed in the grave of the dead chief or king. As Sir George Hill points out in his admirable book on Treasure Trove, it is the hiding of objects and not the abandoning of them which gives the Crown a property in finds in England. It is often difficult to decide whether objects (for instance a single gold brooch or a single gold ring) have been hidden or merely thrown away or lost. The coroner in the recent case rightly pointed out to the jury that concealment in secrecy, with intention on the part of the owner to return and recover his hoard, is an essential point to consider. In the Sutton Hoo ship burial, the ship had been hauled up from a stream 100 feet below and had been dragged into a large trench 100 feet long, 20 feet wide and 10 feet deep A large mound had been erected over the final structure, containing at least 1000 tons of turf cut from the surrounding heath The objects of gold and silver would have been buried with the dead man for the traditional purpose of ministering to his comfort and dignity in another life. Probably the ceremony was accompanied by many days' celebration and feasting. These facts and inferences negatived any idea of hiding or concealment in the case of the Sutton Hoo treasure and therefore removed it from the technical category of treasure trove.

In the various legal systems of this and other countries there has nevertheless been doubt whether gold or silver was treasure trove when deposited in a tomb or coffin. Ancient Roman law introduced a complication by providing that to bury a body in a place was to lose possession of the place. In an Italian case, decided some forty years ago, a court in Florence held that the contents of an Etruscan tomb were treasure. In English jurisprudence, which has its own peculiarities, the so-called Laws of Edward the Confessor declared that treasures from the earth belong to the King unless they be found in a church or cemetery (*in ecclesia vel in cimiterio*).

Thirteen gold nobles found in a vault under the church floor at Halsall, lying on top of a coffin, were held by the Treasury in 1922 to be treasure trove Here, Sir George Hill says, there was no coroner's inquest Presumably the coins, having been placed outside the coffin, were not buried for religious reasons but with the intent to return and recover them. Sir George Hill cites another case of uncertain date where pennies of Alfred were found in the hollow of the left shoulder of a skeleton at Leigh-on-Sea These were declared not to be treasure trove It is a matter of history that the Crown granted licences or directions to dig in howes or barrows from early times in England in search of treasure There is an order to the Earl of Cornwall in 1237 The rifling of hoards, whether in the interest of the public exchequer or the predatory individual, must have been common in all ages The life of St Guthlac shows that at the end of the seventh century the saint made his habitation in a chamber discovered by searchers for treasure in the side of a barrow It is satisfactory to know that treasures still survive and that, as in the Sutton Hoo case, the owners will provide for their public custody

CHEWING THE CUD AND FROG IN THE THROAT

A CASE of pseudo-rumination is reported by J B L. Valle, who uses the term "mericism" for it He says that it is a nervous tic that depends on the abnormal shape of the stomach, is very rare, and is to be distinguished from involuntary regurgitation, which is very common (*Bol Soc med chir Juiz de Fóra*, 1938, 11, 415) This chewing of the cud is commoner in men than in women and is seen in imbeciles It hardly differs from the physiological act of ruminants and takes place usually 10–20 minutes, or rarely 3–4 hours, after food There is possibly some connexion with aerophagy, and Valle points to the analogous action in birds (we may instance "pigeon's milk" and the pellets of robins, kestrels, owls, and kingfishers) and the custom of the ancient Romans, at their orgies, of inducing voluntary vomiting by titillation of the uvula

Valle distinguishes two types simple and pathological The former is congenital in normal healthy persons and is habitual and quasi unconscious The pathological type is due to dyspepsia or nervous disease He had known his patient for ten years and describes him as a healthy man aged 35, working for his living There was no neuropathic history in the patient or his family He had always chewed the cud, and up to the age of 12 he had thought that everybody did so He then became anxious about his peculiarity and wished to be cured There was no sign of disease, and his intelligence was excellent Valle tried psychotherapy, including suggestion and attempts at voluntary control, but failed to cure him

In this connexion it is interesting to note that there is at present a man who earns his living in the south of France partly by exploiting his powers of returning his gastric contents at will He begins by drinking about three litres of water while balancing a chair on his forehead Patter follows to the effect that he has drunk too much and will return some Thereupon he ejects a stream of water about a yard long with considerable force Next he takes a frog and, placing it head first between his lips, gradually sucks it into his mouth and swallows it (fig 1) More patter follows, and after a minute or so he swallows a second frog Eight frogs in all are swallowed, with intervals of patter He then talks and laughs for about five minutes before regurgitating the frogs, which come singly out of his mouth (fig 2) at intervals of about a minute between spells of patter The whole process appears to be entirely voluntary He

FIG 1—Going down

FIG 2—Coming up

gains roars of laughter and applause by announcing that one particular frog says: "When I come back to the world, I like to climb on to master's nose." The announcement of the forthcoming return of a frog precedes the frog's actual return by a few seconds.

CARDIAZOL AS A DEPRESSANT

AFTER comparing the results of treatment of schizophrenia with Cardiazol, sodium Amytal, and alcohol, W. P. Berrington (*J. ment Sci* May, 1939, p. 474) concludes that these drugs act in a similar manner and produce their effects on catatonic stupor by virtue of a depressant action on the highest inhibiting (cortical) centres, as originally suggested for sodium amytal by M. W. Thorner Twelve patients were treated with alcohol, and the results were like, though less pronounced than, those of sodium amytal. Berrington also thinks that studies of prepsychotic personality of catatonic dementia præcox support the hypothesis of excessive inhibition as the modus operandi of one type of catatonic stupor.

There is much contradictory evidence about the supposed modes of action of cardiazol, but support for Berrington's view may be found in the results of earlier experiments on animals. Thus A. H. Maloney in 1936 described the production of depression and death with large doses of this drug, and A. Leroy and P Clémens in 1937 noticed catatonic reactions to cardiazol in experiments on rats: 1 mg caused diminution of spontaneous and of provoked muscular activity, 2 mg. produced convulsions, hyperæsthesia, and hyperkinesis; while larger doses were fatal. Their findings were confirmed by Gutiérrez-Noriega in Peru, for dogs also. J. A. F. Denyssen and D. J. Watterson (*J. ment. Sci.* 1938, 85, 1006) found that in an intact animal small doses of cardiazol increased the reflex excitability, whereas larger doses caused epileptiform convulsions, and massive doses paralysis Gutiérrez-Noriega, Rotondo, and Alarco (*An. Fac Cienc méd., Lima*, March, 1939, p. 263) divide the effects observed after the intravenous injection of cardiazol in dogs into five periods: (1) psychomotor excitation; (2) convulsions; (3) muscular inhibition and incoordination, sometimes resembling the coma that follows epileptic convulsions; (4) catatonia; and (5) recovery. In 100 experiments on 70 dogs catatonia was produced in 57 per cent. of cases, and it was also produced in 36 per cent. of experiments in 15 cats. The experimenters conclude that the catatonia was not due to the convulsions, because some of the dogs had catatonia without having had convulsions. Experiments repeated in the same dogs showed that the various reactions were always true to type for the particular dog, suggesting constitutional variation. Gutiérrez-Noriega and his colleagues conclude that cardiazol has a depressant action like that of alcohol.

STERNAL PUNCTURE

STERNAL puncture is useful for making a rapid diagnosis, especially in pernicious anæmia, pseudoleukæmia, acute leucopenic leukæmia, and aplastic anæmia,[1] but it gives little information which cannot be obtained by examining the peripheral blood Nevertheless a book by Dr Fieschi[2] is of great interest. It contains a gallery of hæmatological pictures obtained by sternal puncture, reproduced in 111 text figures and 10 beautifully coloured plates. Not only are the appearances minutely detailed for most blood diseases, but also an attempt is made to interpret them in terms of bone-marrow function. Special attention is paid to karyokinesis in normal and in pathological conditions. The ease with which sternal puncture can be performed may lead to many errors on the part of those inexperienced with myelograms Consequently sternal puncture should be regarded as only one of several diagnostic methods in blood disease; and the characteristic polymorphism of the bone-marrow needs an expert to interpret it. Another difficulty is the lack of homogeneity in the distribution of the myeloid parenchyma in all bone-marrow, even in the most homogeneous tissue of the sternal marrow. Nevertheless sternal puncture has revealed invaluable information concerning the erythroblastic reactions in secondary anæmias In the interpretation of the myelogram a qualitative analysis is insufficient; it must be quantitative to show the state of hæmopoiesis or of maturation, and the karyokinetic changes must be accurately recorded to estimate the rate of proliferation—an estimation which, however, cannot be absolute Aberrations and degenerative phenomena in karyokinesis must also be carefully observed as clues to morbid processes

1 Hynes, M., *Lancet*, 1939, 1, 1373
2 Semeiologia del Midollo Osseo By Aminta Fieschi Pavia Tipographia gia Cooperativa 1938 Pp 354 L 70

CHINESE ORTHOPÆDIC CENTRE

IN our issue of July 8 (p. 99) the British Orthopædic Association appealed for help in establishing an orthopædic unit behind the Chinese lines This unit, it is hoped, will form the nucleus of an orthopædic centre which is to be established at the Emergency Medical Service Training School at Kweiyang The training hospital attached to the school would put 300 of its 1000 beds at the disposal of the unit, which would thus be able to make use of the existing organisation for the selection of cases and train the medical personnel of army hospitals in correct orthopædic procedures. Other divisions of the centre will undertake the production and fitting of appliances, the provision of physical treatment and the supervision of exercises. Suitable vocational training will be arranged for individual cases, and finally the centre will arrange with the provincial government for the settlement of each soldier after his discharge Orthopædic patients have to spend long periods waiting—between successive operations, or for the fitting of an appliance, or during a course of physical therapy—when it will not be possible to spare bed space in the hospital itself for them. At first these men will be accommodated in the Army Cripples' Home, but it is hoped shortly to complete the centre by establishing a disabled soldiers' hostel where they need no longer live under a hospital regime and more can be done for their welfare An appeal for funds for this hostel is being made by the Foreign Auxiliary to the National Red Cross Society of China

MEDICAL ABERDEEN

Dr. David Rorie compiled a singularly interesting "Book of Aberdeen" for the British Medical Association's meeting last month. Published by the executive committee of the Aberdeen division, it is printed by W. and W. Lindsay (28, Market Street) and consists of essays on the university, the medical history of the town, the medico-chirurgical society, the various hospitals, the public-health administration, the Rowett Institute and other research institutions, and the scenery, literature, historical remains, and folk-lore of the district, together with much else. Dr Rorie's chief collaborators have been Mr. Alexander Keith and Dr. G. A. G. Mitchell, but the book is a true symposium, and many doctors have contributed their quota of information and scholarship. For the medical visitor to old and new Aberdeen no better guide could be desired.

NEW MATERNITY DEPARTMENT AT NEWCASTLE.—On Aug 10 Mr J. E Scanlan opened the new maternity department of the Newcastle General Hospital. This serves to remind one that the earliest provision of hospital beds in the Newcastle workhouse was for maternity cases The new department has three sections, which between them accommodate 30 beds. Of these 22 beds are for normal cases, 5 are for patients suffering from minor degrees of sepsis, and 3 in a separate building are for "suspect" cases In the main the accommodation has been planned in single- and two-bedded wards, though there are two larger wards, each of 4 beds, and a nursery. For protection against air-raids, Dura-steel has been inserted in the ceilings of the operating-theatre and labour ward annexe and armoured glass has been used in the windows

1939 Students Guide 1940

HOW TO BECOME A DOCTOR

For thousands of years medicine has united the aims and aspirations of the best and noblest of mankind To depreciate its treasures is to discount all human endeavour and achievement as naught —Karl Marx

The branches of medicine now extend so widely that anyone of average intelligence, from the shyest bookworm to the heartiest sportsman, can find an agreeable niche in them There is almost as varied a choice of jobs inside the medical profession as outside it, and the doctor can find a use for talents as far apart as carpentry and foreign languages The candidate must give up at least five and a half years to vocational study, but in return he can count on a life full of human interest and a greater probability of a living wage than in the other professions From the day of qualification he will be able to keep himself, and he will soon be earning enough to meet all reasonable needs He *is unlikely to make a fortune, but* he *is still more unlikely to starve*

PRELIMINARY EDUCATION

It may be wise if there is a chance of a boy (or a girl) *becoming a doctor to send him to a school that offers special facilities for teaching the preliminary* scientific subjects In any case he should if possible make up his mind to take up medicine in time to pass the examinations required for entry into a medical school before he leaves This is not to say that he should begin to study the more specialised medical subjects too early A good general education is the essential basis for a good doctor, and this is the idea behind the recommendations made by the General Medical Council last year The council recommend that before a student begins his medical course proper he should be 18 and should have passed two examinations (*a*) an examination of university matriculation standard *in arts or pure* science, or in English mathematics, a foreign language, and a fourth subject chosen from geography, botany, history, science, or a classical or modern language, and (*b*) an examination in chemistry, physics, and (except for those who do their chemistry and physics at a medical school) one or two other subjects of general education at a standard higher than (*a*) The student must, of course, pass (*a*) before going to a medical school, and he may also be able to pass or gain exemption from (*b*), which will save him a year Not all schools, however, teach these scientific subjects up to university standards, and it may be better for a student to start his medical training at a medical school, so that he has a year to find his feet there on the more or less familiar ground of pure science Apart from any obligation to acquire them, a knowledge of French and German is an undoubted asset to a doctor It must be remembered too that character and ability to deal with his fellow men rather than intellectual brilliance, make for *success in medicine, and a period of residence abroad* will do more to develop these qualities than an extra year at school

CHOICE OF SCHOOL

The student should decide where he is to do his training at least a year before he intends to go there, for there is some competition for entry and he may be eligible for an entrance scholarship He must first make up his mind whether he is to aim at a *university degree or at a qualifying diploma of one* of the other examining bodies, such as the three Conjoint Boards Either of these will allow him to practise, but a degree will give him a higher professional standing, more particularly perhaps in the eyes of laymen, and will be a help later in obtaining appointments and possibly even patients A diploma, on the other hand, can be obtained in about six months less time, and, the standard being lower than that of most degrees, will appeal to the *student who* finds examinations a stumbling block Ability as an examinee should not be judged, however, purely on a school record, for boys who have been labelled *dull because school subjects did not appeal to them* often take an interest in medicine and pass their professional examinations with ease

On the whole the student will be well advised, at any rate in the first place, to aim at a degree In London the custom is to enter for the degree course (most schools now insist on this), pass the final diploma examination at the earliest opportunity, and take the degree later In this way the student will be qualified and can take resident appointments *while he is doing the last year's work* for his degree, thus gaining valuable experience, earning his keep, and saving tuition fees The possession of a conjoint *diploma also allows the* M R C P or F R C S and the Oxford M B to be taken earlier

In England the next decision to be made is whether the student will go to one of the universities that teach the preclinical subjects only—such as Oxford, Cambridge and King's College, London—for the first three *years and then on to a hospital*, to one of the provincial universities that provide a complete curriculum, or direct to a London hospital for the whole course The choice is determined by family traditions, financial considerations, including the *scholarships* available, and the student's individual ability—and often one of these is so strong that there is no choice at all, the brilliant student, for example, will go where his scholarships lead him, and in some families it may seem sacrilege not to go to Oxford

It is board and lodging rather than fees that make the medical course expensive, so that the student who must qualify as cheaply as possible should go if he can to a school near enough for him to live at home At a *London school* all professional expenses will be covered by about £100 a year, including midday meals and travelling For the 5½ years' M B course the tuition fees will be about £250, books, £20, examination fees, £32, microscope, £20, *instruments* and sundries, £25 At some of the provincial universities, and especially in Scotland and Ireland fees are lower At University College Dublin for instance, the total tuition fees amount to only £130 In London the average cost of maintenance

—board and lodging, clothes and so on—is about £150 a year, and here again the cost is often lower in the provinces and certainly in Scotland and Ireland. At Oxford and Cambridge expenses depend even more than elsewhere on the tastes of the individual, for there is more temptation to extravagance, and they also vary at different colleges; but in the ordinary way £250 a year should cover everything except keep during the vacations. The undergraduate who, apart from scholarships, has to make do with less will miss so much by being unable to take a full part in university life that he will be wiser to go elsewhere. In order to take a London M.B. degree the student who lives in lodgings must spend about £220 a year for 5½ years: some £1200 If he lives at home he may save nearly half of this A conjoint qualification will cost him about £1100 if he lives in lodgings or say £550 if he lives at home. If he goes to Oxford or Cambridge for his first three years and to a London hospital for the last three his degree will cost him about £1450; he may easily spend more.

There is much to be said for doing the first three years at a university where the medical student can mix with men reading other subjects In this way he may acquire interests outside medicine, which is bound to fill the greater part of his thoughts, and may avoid the parochialism that infects some who spend five years in one school. Others may be upset by a change of environment in the middle of training and gain from getting to know something of the hospital routine and the hospital staff before entering the wards

THE LONDON SCHOOLS

All the London schools form part of the University of London, but their students are not strictly members of the university unless they have matriculated, and a large proportion come to London to do their clinical work after spending three years at Oxford, Cambridge or other universities. There are two schools which teach the preclinical subjects only—University College and King's College; and one that teaches only the first M B subjects—Queen Mary College In general University College prepares students for University College Hospital, King's College for Charing Cross, St. George's, King's College or the Westminster Hospitals; and Queen Mary College for the London Hospital St. Bartholomew's, Guy's, St. Mary's, the Middlesex and St. Thomas's Hospitals cater for the whole curriculum, as does the Royal Free for women students Charing Cross, St George's, K C.H., the London, U.C H, Westminster and West London only take students for the clinical years

Of the thirteen hospitals St. Bartholomew's, Guy's St. Mary's and St. Thomas's have the largest schools; St. George's, Charing Cross, Westminster, and the new West London the smallest. The important consideration is, however, the proportion between the number of students in the wards and the number of hospital beds available for teaching Several schools in the past have suffered severely from overcrowding. The label of a big school may carry weight with the public and with appointment boards later, and it usually possesses greater facilities for games, acting and music, debating, and the like, whereas the small school offers more individual teaching and the charm of knowing everybody. The student of average ability and the quiet, retiring man will probably do better at a small school where there is less competition; whereas the big fish may find more scope in a big pond. A house appointment at a teaching hospital is an invaluable preliminary to any branch of practice, and it is well to inquire what proportion of students succeed in getting one and how appointments are made—whether by competitive examination or on more general worthiness, including athletic ability, and whether Oxford and Cambridge men are favoured. If a man has friends on the staff of one hospital it may be wise to go there, not because he will be favoured but because he will start by being known Finally, especially when health is a consideration, the locality of the school and of the district where the student has to live is of some importance. In his final years he will become more and more tied to the hospital and it may be neither pleasant nor prudent to bury himself in more squalor than he need.

OUTSIDE LONDON

In return for their costliness Oxford and Cambridge offer certain advantages that are not easy to define. The influence of tradition and of the college atmosphere, and the opportunities for such recreation, both athletic and social, as the curriculum leaves time for, do much to mould the character of a man at his most impressionable age The undergraduate's freedom is still restricted to a certain extent, so that he is less likely to be intoxicated by sudden liberty The friends he makes both inside and outside the profession will stand him in good stead later, as will the prestige of his degree and his "college tie" On the other hand, the medical education at Oxford and Cambridge is much criticised just now. It is said that their teaching caters only for the scholarship man, and that the average student is apt to be discouraged; that too little stress is laid on the connexion between scientific knowledge and its practical application, because the teachers are out of touch with the needs of practice The terms are too short, and they have become so filled with lectures and laboratory work that the leisure for physical and mental culture is seriously restricted The standard of the new medical tripos at Cambridge, in which the student must take second-class honours if he is to obtain his degree without loss of time, is too high and there is danger that many men will leave Cambridge with no degree at all At Oxford too the pathology course is too advanced for students with no clinical experience, and they tend to learn pathology as a separate subject divorced from clinical medicine No doubt these faults are temporary, and there is no question that these universities turn out some of the best men met with at the London schools.

As regards size the English provincial schools run the London schools closer than is generally realised Liverpool, for instance, has over 650 medical students to St. Bartholomew's 750. Durham, Birmingham and Leeds each have between 400 and 500. Their supply of clinical material is as a rule larger and more varied than in London, for in London the greater part of the vast number of beds controlled by the London County Council is not available for teaching Their opportunities for practical midwifery are also on the whole better. The greatest asset of the provincial universities is, however, one that they share to a variable extent with Oxford and Cambridge —namely, that because they are not only medical schools they help to cultivate that breadth of outlook that leads to wisdom rather than mere knowledge

Some of the provincial universities have special regulations that should be inquired into before the intending student leaves school. The Welsh National School at Cardiff, for instance, does not allow exemption from the intermediate subjects of chemistry, physics and biology on the higher school certificate

but insists on its students doing three years preclinical work in the university and taking a degree in science or arts

SCOTLAND

The medical schools of Edinburgh and Glasgow are the largest in the British Isles, Edinburgh having some 1300 students and Glasgow 1250, counting some post graduates doing special courses and occasional students The Aberdeen school is smaller, with some 475 students, and St Andrews smaller still In addition, the School of Medicine of the Royal Colleges, in Edinburgh, which prepares students mainly, though not entirely, for the Scottish and other Conjoint Board examinations, has an average of over 500 students A large proportion of Scottish students live at home, fees are low, far more bursaries and scholarships are available than elsewhere, and the Carnegie trust makes grants towards the tuition fees of Scottish students whose means are limited The student who must qualify cheaply can therefore probably do so most easily in Scotland Students no longer enter their medical school at the age of 16, which used to reduce the cost of training, though it must at the same time have reduced the standard of general education The teaching is good from the theoretical standpoint, though Edinburgh in particular is still overcrowded and its graduates suffer accordingly from lack of practical experience The Scottish student is a much freer person than the undergraduate of the Sassenach universities, and his private life is more of his own making

IRELAND

In Ireland the student has the choice of three large university schools—Trinity College and University College in Dublin, and the Queen's University in Belfast—two smaller university schools at Cork and Galway, and one non university school, that of the Royal College of Surgeons in Dublin The primary aim of all of these is to fit their students for general practice, and their teaching is therefore essentially practical They have long adopted the admirable system that dates from apprentice days whereby students spend some months as "resident pupils" in a hospital with definite duties assigned to them Fees and living expenses are low in all Irish schools, and as most Irish students have limited means there is little temptation to extravagance Of the three Dublin schools, Trinity College has a great and ancient tradition of culture, it is independent and protestant, and is slowly changing from a predominantly tory to a liberal outlook It has always had a close connexion with the services University College, which with the colleges at Cork and Galway make up the National University of Ireland, is comparatively modern, but what it lacks in tradition it makes up in youthful keenness Its connexion is more with the public services at home, and it is catholic and national The school of the Royal College of Surgeons is purely a medical school, and its students lack the intercourse of university life, but the teaching is excellent It is neither catholic nor protestant, national or otherwise The huge sum collected by the sweepstakes (nearly £14 000,000) is bound to lead to a great development in scientific medicine in Dublin, with increased opportunities of research appointments and probably paid assistantships in the hospitals

WOMEN STUDENTS

In London only three schools—the London (Royal Free Hospital) School of Medicine for Women, King's College, and University College—admit women for the preclinical years, and at all of these the competition for admission is keen, at the Royal Free there are some 200 applicants for the 60 annual vacancies Queen Mary College can now take a few women for the first M.B subjects As regards clinical work the Royal Free covers the whole curriculum, King's College and University College hospitals each take 12 women students a year, the new school at the West London is largely intended for women, and thus year has 37 women to 6 men The great majority of women who train in London, however, go to the Royal Free, either for the whole course or after having done their early years at Oxford, Cambridge, University College or elsewhere

At both Oxford and Cambridge the standard for admission to a college is higher than for men, and at Cambridge women are not yet admitted to full membership of the university, though this makes little practical difference Those who do their early years at these universities have little difficulty in finding places for their clinical work At most provincial universities women are on an equal footing with men, and at Bristol and Manchester, for instance, are well supplied with halls of residence The same applies to Scotland, where Glasgow has nearly 200 women in its medical school, and to Ireland Thus, though in London the path for women into the medical profession is narrow, elsewhere the openings for the average woman are no less wide than for a man

MILITARY SERVICE

The Government has announced that all university students may postpone their period of service with the militia until after they have finished their course, or alternatively prospective students may apply to anticipate their service as soon as they reach the age of 18, so as to fit it in before they go to the university It is now clear that this also applies to medical students, university or otherwise Few of them are likely to take advantage of the option to antedate, for it will mean a break in their work for the first M.B, nearly all will go from school to university or medical school in the normal way and on reaching the age of 20 will apply to a tribunal for exemption from military service Those already at a university or medical school will do the same Exemption will be granted for twelve months at a time and the student must apply for its renewal every year The deans of medical schools will inform the tribunals of the date on which each student should qualify, it is understood that exemption will be granted until that date, but not necessarily beyond it, so that a student who repeatedly fails in his final examination may be called up What form the training of medical militiamen will take is not yet known—the Government has two years in which to decide—but it will presumably be in association with the medical and not with the fighting services

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". The student, once entered on his mental pursuits, must engage in them zealously, determinately, perseveringly The temptations of a luxurious city must not lure him from the sick patient, the dead body, the laboratory, or the library This is not the season for sensual indulgence He should not fear that if he fails to witness this attractive sight, or partake of that novel pleasure, no other opportunity will offer to see and feel what is delightful of the same kind Let him postpone those enjoyments of London which are foreign to his present business to a future and better season He will meet them with a higher relish, when advancing time has improved his taste and heightened the refinements of life, and they will then leave behind no sting, because he will be master of his own time and resources"—*The Lancet* Students' Number, 1839

REGISTRATION

GENERAL MEDICAL COUNCIL

THE duties of the General Council of Medical Education and Registration of the United Kingdom are fourfold First, it is responsible for registration: no one is a *legally qualified* medical practitioner until his name appears on the Medical Register. Secondly, it is a standardising body, ensuring that there is a definite minimum of medical education and examination requirements Thirdly, it is responsible for discipline within the profession and has the power to remove from the Register any practitioner convicted of a criminal offence or judged by the Council to have been guilty of infamous conduct in any professional respect Fourthly, it has the exclusive right of printing, publishing, and selling the British Pharmacopœia.

The Council consists of 39 members, of whom 18 are chosen by universities and 9 by licensing corporations; 5 members are nominated by the Crown on the advice of the Privy Council, and 7 others are elected by the members of the medical profession as direct representatives The Crown members and the university representatives need not be medical men, and one layman appointed by the Privy Council now sits on the Council. Three additional members are appointed for dental business by the Privy Council under the Dentists Act, 1921, which retained in the hands of the General Medical Council the power of erasure from the Dentists Register and the functions in regard to dental education originally conferred upon it by the principal Act of 1878.

The Educational Curriculum

The course of professional study after admission to a school of medicine as a student commencing the medical curriculum proper occupies at least five years The final examination in medicine, surgery, and midwifery must not be passed before the close of the fifth academic year of medical study.

ADMISSION TO MEDICAL SCHOOLS

Any application to be admitted to a school of medicine on beginning the medical curriculum proper should be addressed to the dean or other appropriate authority of the school to which the applicant desires to be admitted. Students are no longer registered by the General Medical Council before their admission to schools, and it rests with the authorities of schools and of licensing bodies to deal at their discretion, without further reference to the Council, with applications for admission to schools. Applications are now considered by the authorities of schools and of licensing bodies in the light of the recommendations of the Council in regard to the registration of medical students, incorporating resolutions in regard to general education and preliminary scientific subjects, which came into operation on Nov. 1st, 1938 The relevant provisions of the recommendations are as follows.

The Council recommend that, subject to such exceptions as may from time to time be allowed by the authorities of schools of medicine and of licensing bodies, every medical student, before the commencement of the medical curriculum proper, should be registered under the following conditions.

1 Before registration as a medical student every applicant should furnish evidence that he has attained, or will within three months attain, the age of 18 years.

2 Before registration as a medical student every applicant should be required to have passed—

I A recognised preliminary examination in general education

II An additional examination, or additional examinations, conducted or recognised by one of the licensing bodies

I. PRELIMINARY EXAMINATION IN GENERAL EDUCATION

3. The minimum standard of the preliminary examination in general education required of applicants should be that of a university matriculation or entrance examination in the faculties of arts or pure science. If in other faculties the examination should be of the same standard, and should include the subjects specified in section (1) of the following recommendation

4 (1) The Council have recognised as complying with the recommendations the following university examinations which admit to the faculties of arts or pure science, or, *subject to the condition specified below*, to other faculties; the matriculation examinations of the Queen's University of Belfast, the Universities of Dublin, London, Wales, and the National University of Ireland; the previous examination of the University of Cambridge; responsions at the University of Oxford; and the entrance or preliminary examination of the Scottish Universities.

The condition specified in respect of faculties other than arts or pure science is that .—

The certificate shall bear evidence that the candidate has passed, on the matriculation or entrance standard, in the following subjects, viz :—

(*a*) English; (*b*) elementary mathematics; (*c*) a language other than English; (*d*) a fourth subject to be chosen from history, geography, botany, physical science, natural science, Latin, Greek, French, German, or other language accepted by the university for the purpose of matriculation or entrance.

(2) Subject to the condition specified in section (1) of this recommendation, the Council have recognised as complying with the recommendations those of the examinations conducted by recognised authorities in Great Britain and Northern Ireland, or in Eire, which are accepted by any one or more of the universities of Great Britain and Northern Ireland, or of Eire, under the conditions prescribed by them as to "credits" or "grades," as qualifying for entrance or matriculation When a school certificate is presented, the credits in the four required subjects should have been obtained at not more than two sittings

(3) The Council will continue to recognise as complying with the recommendations certain examinations other than those which are mentioned in section (2) of this recommendation. Recognition will not be extended under this section to any examination unless the Council are satisfied (*a*) that in scope and standard it is equivalent to a recognised matriculation or entrance examination of a university of Great Britain and Northern Ireland, or of Eire; (*b*) that it fulfils the condition specified in section (1) of this recommendation, and (*c*) that the examination has been completed at not more than two sittings The examinations so recognised are: the College of Preceptors (England), senior certificate (with credit); the Educational Institute of Scotland, preliminary medical certificate; Irish Royal Colleges of Physicians and Surgeons, preliminary examination in general education

(4) Subject to the condition specified in section (1) of this recommendation, the Council will recognise as

complying with the recommendations such examinations of universities in British India, in British Dominions other than Eire (with respect to which provision is made in the foregoing sections), in British Colonies, and in foreign countries, as are accepted by any one or more of the universities of Great Britain and Northern Ireland, or of Eire, as qualifying for entrance or matriculation

II ADDITIONAL EXAMINATION OR EXAMINATIONS

5 The subjects and scope of the additional examination or examinations which applicants should be required by the licensing bodies to have passed before registration as medical students are as follows —

(1) For all applicants, chemistry (theoretical and practical) the elementary principles of general and physical chemistry, and of the chemical combination of elements, including carbon

(2) For all applicants, physics (theoretical and practical) the elementary mechanics of solids and fluids, the elements of heat, light, sound, electricity, and magnetism

(3) For applicants who have received their instruction in chemistry and physics before entering universities, university colleges, or medical schools, one or two subjects of general education other than chemistry, physics, or biology, at a standard higher than that of the recognised preliminary examination in general education

The standard of the additional examination in a subject or subjects of general education should be approximately that required in a subsidiary subject offered for the higher school certificate at the examinations specified in section (2) of the previous recommendation

Note—It should be open to applicants to offer themselves for examination in the subject of biology either before or after they are registered as medical students

Medical Registration in Ireland

By legislative agreement between the Governments of Great Britain, of Eire, and of Northern Ireland, the powers and duties of the General Medical Council are continued as heretofore in respect of qualifying bodies in Eire and of medical practitioners qualified in Eire and registered by the Council Side by side with this a Medical Council has been set up in Eire with the duty of establishing and controlling a Register for Eire Practitioners whose names are on the Register kept by the General Council and persons who pass a qualifying examination in Eire, are entitled to registration in the Register of Eire on payment of the prescribed fee The Medical Council of Eire have, over those whose names are on the Register kept by them, the same disciplinary powers as are possessed by the General Council over those whose names are on the Register kept by that body To possess the privileges of a qualified practitioner in Eire it is necessary to be registered in the Register for Eire

The net result of the change in the law as regards the practitioner qualifying in Eire in the future is that (1) if he intends to practise only in Eire he need only register in the Register for Eire, (2) if he intends to practise in Great Britain or Northern Ireland he will register in the Register kept by the General Medical Council, and (3) if he is in doubt where he will practise he will register in both Registers He will, as he registers in one Register, or in both Registers put *himself* under the disciplinary control of the one council or of both councils No practical inconvenience is caused, and practitioners qualified in Eire in future will not find themselves deprived of any former privileges or rights

DENTAL BOARD OF THE UNITED KINGDOM

Anyone who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without a degree or licence in dentistry, but it is a distinct advantage to take a special dental qualification, otherwise few dental appointments at general or special hospitals or dispensaries are available, and, under the National Health Insurance (Dental Benefit) Regulations, a registered medical practitioner cannot give dental treatment to insured persons as an additional benefit unless he is registered in the Dentists Register

Under the Dentists Act, 1921, substantial parts of the functions of the General Medical Council under the Dentists Act, 1878, and under the Medical Act, 1886, which related to the keeping of the Dentists Register and the administration of the Dentists Acts were transferred to the Dental Board of the United Kingdom As stated above, the power to erase a name from the Dentists Register remains with the Council, but the inquiry into disciplinary cases rests with the Board, who forward their reports and findings to the Council

The Dental Board consists of a chairman and 12 members The chairman is appointed by the Privy Council Other members of the Board are appointed by the Minister of Health, the Department of Health for Scotland, the Governor of Northern Ireland, and the General Medical Council (3), four members are elected as representatives by the dentists possessing degrees or licences in dental surgery or dentistry, and practising in England and Wales, Scotland, and Ireland, and two by dentists registered under the Dentists Act, 1921

ADMISSION TO DENTAL SCHOOLS

Any application to be admitted to a school of dentistry on beginning the dental curriculum proper should be addressed to the dean or other appropriate authority of the school to which the applicant desires to be admitted Students are no longer registered by the General Medical Council before their admission to schools, and it rests with the authorities of schools and of licensing bodies to deal at their discretion, without further reference to the Council, with applications for admission to schools Applications are now considered by the authorities of schools and of licensing bodies in the light of the recommendations of the Council which came into operation on Nov 1st, 1938, and of the recommendations of the Council as to the course of study and examinations to be required of candidates for licences in dentistry or dental surgery which came into operation on Oct 2nd, 1933, and were amended by the Council on May 24th, 1938, so as to bring them into harmony with the recommendations in regard to the registration of students

The relevant provisions of the recommendations as to the course of study and examinations to be required of candidates for qualifications in dentistry are as follows —

1 That, subject to such exceptions as may from time to time be allowed by the authorities of schools of dentistry and of licensing bodies, every dental student at the commencement of his studentship should be registered in the same manner as a medical student, and under the same conditions with respect to age, preliminary examination in general education, and additional examination or examinations, provided that it should be open to applicants for registration as dental students

to commence professional study either at a recognised dental hospital or school or as pupils of a registered dental practitioner.

2. That, with respect to applicants who have served an apprenticeship in dental mechanics, an applicant who has served two or more years subsequent to his attaining the age of 17 as a bona-fide apprentice in dental mechanics with a registered dental practitioner should, if the licensing bodies think fit, be allowed to antedate his registration for a period not exceeding six months

3 That before registration as a dental student every applicant should furnish evidence that he has attained, or will within three months attain, the age of 18 years.

4. That before registration as a dental student every applicant should be required to have passed (*a*) a recognised preliminary examination in general education, which should be the same as that required for medical students; (*b*) an additional examination, or additional examinations, conducted or recognised by one of the licensing bodies, which should be the same as the examination or examinations required for medical students

Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months practical instruction in dental mechanics It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school.

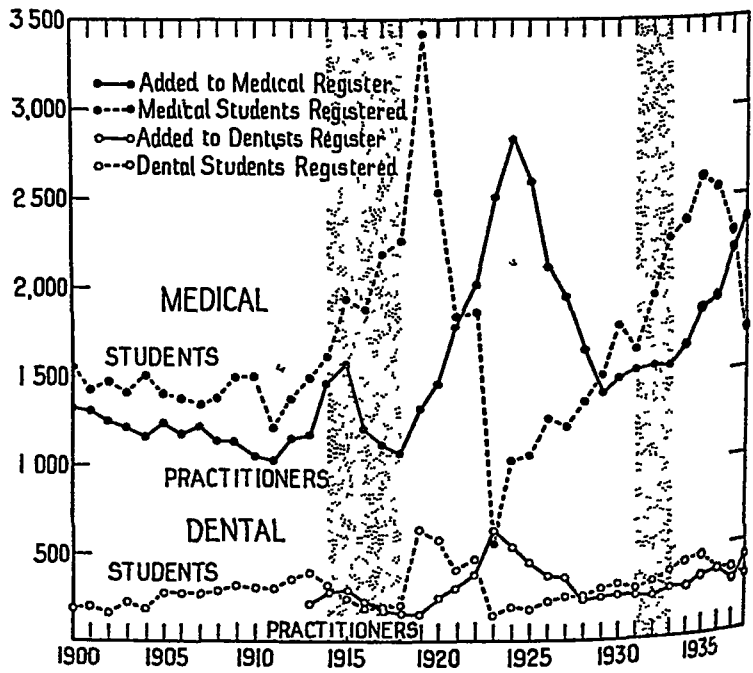
THE NUMBERS WHO ENTER

No-one knows exactly how many medical students there are at the present moment For many years past the General Medical Council has published a list of medical and dental students registered during the previous year and from this list we have prepared the accompanying graph; but the list has admittedly never been complete. There was no legal obligation on the medical student to register; whether he did so or not depended on the custom of his particular school Now the custom has changed. Last year the G.M C decided to give up direct registration and to print instead the names of students reported as having been admitted to the various schools of medicine or dentistry, the period chosen being no longer the calendar year but an academic year beginning Sept. 1. The first students' register in its new form is to appear next month and by the courtesy of the registrar we are able to state that it will contain the names of about 1735 medical students and 315 dental students Internal evidence suggests that whereas the dental list may be complete the medical list may be short by 400 or 500 names. For this reason it would be unwise to draw any deductions from the apparent continuance of the sharp fall in the number of medical students which began in 1935. It may, however, be regarded as certain that this year the number of medical qualifications has exceeded the number of student entries, as it did in the period 1922–29 when there was a trough in the student entry following the colossal peak of 1919–20. The last twenty-five years have now shown two complete oscillations, with a return to near the pre-war norm. No doubt various factors have contributed to their causation, the most important being war conditions and bad trade—both of which act, in different degree, as a spur to medical recruiting

In drawing conclusions from the registers on qualification[1] we are on safer ground. The number of names added to the Medical Register last year was 2365, being 151 more than the figure of the previous year. The rising curve is not so sharp and the summit is probably in sight. Taken by regions, most of the increased medical registration was in England (154) and Ireland (56), while there was a drop of 3 in Scotland and a plus of only 4 in the colonial section. Only the foreign section contains any surprise, with 53 names against an average of 12 for the last twenty years. The total number of names on the Medical Register on Jan 1 was 61,420, being 257 more than last year.

The Dentists Register also shows a substantial plus of entries (408), being the highest number in the decade except for 470 in 1936; but here we have to reckon during the last three years with a large increase in the foreign list, which fell to the modest number of 15 in 1938. Taking British alone, the increase of 384 was almost without record, the number only having been exceeded during the transitional period 1923–25.

1 The Medical Register for 1939 (21*s*), The Dentists Register for 1939 (12*s*): both published for the General Medical Council by Constable and Co



MEDICAL SCHOOLS OF ENGLAND AND WALES

UNIVERSITY OF OXFORD

THOUGH the Oxford faculty is the oldest in the kingdom, systematic university teaching for students of medicine only really began in 1883, when Burdon-Sanderson came from University College, London, to be the first Waynflete professor of physiology From that date onwards there was a steady increase in the provisions for teaching and for the conduct of original investigation, the rate of this increase has in recent years been accelerated by benefactions from the Sir William Dunn Trust to the departments of pharmacology and pathology and from the Rockefeller Foundation to the department of biochemistry, and later by the opening of the Nuffield Institute for Medical Research, followed by Lord Nuffield's munificent further gift of £2,000,000 for the benefit of the medical school The Nuffield professors and their assistants are now at work and the facilities for teaching and research, in both the preclinical and clinical departments, are being considerably strengthened On the other hand, Oxford does not wish to increase the number of its medical students and it is not intended that the average student should complete his clinical work in Oxford The number of medical students of both sexes now in residence in Oxford is about 240, and approximately the same number is engaged in clinical work for the second B M in hospitals elsewhere

At school, apart from acquiring knowledge, the prospective medical student should train himself to think clearly and to write clearly, he is also well advised to learn those languages, in particular German, which will be of use to him in his future reading

Before he can become a member of the university a student has to be accepted by a college or by one of the non-collegiate bodies This normally involves the taking of a college entrance examination, but exemption may be gained on the result of a college scholarship examination or in other ways Next he has to pass, or obtain exemption from, the university entrance examination, responsions, in which Latin is compulsory

He then normally takes the preliminary examinations in physics and chemistry, and in biology These he can attempt before he comes into residence, and it is an advantage to him so to do These examinations satisfy simultaneously the preliminary requirements, both of the university in respect of the B A degree in animal physiology, and also of the General Medical Council in respect of medical qualification

The next step is the examination in organic chemistry for first B M Exemption can only be claimed by those who have passed certain examinations in chemistry of the university A man who has passed the preliminary examinations before coming into residence normally takes organic chemistry in his first term, and thereafter prepares for the examinations in human anatomy and physiology for first B M, which he will probably take in his sixth term He must pass simultaneously in both anatomy and physiology, unless he has previously been placed in the first or second class in the final honours school of animal physiology, in which case he is exempted from the physiology part of first B M Nothing else can exempt him from the examination in this subject, and there is no exemption at all from that in human anatomy

Practically every medical student attempts to obtain the B.A degree by taking the final honours school of animal physiology, for this course diverts him least from purely professional work The special course in preparation for it lasts one year, and the examination may not usually be taken earlier than the eighth term of residence

The student who has passed his preliminary examinations before coming into residence should thus have passed the examinations for first B M, and for the degree of B A, by the end of his third

year He must thereafter prepare for the examinations for second B M The subjects of these are at present materia medica and pharmacology, pathology, forensic medicine and public health, medicine, surgery, and midwifery At a future date, however, the pathology will become general pathology and bacteriology and special pathology will be included in medicine, surgery, and midwifery In addition, materia medica and pharmacology will become pharmacology and the principles of therapeutics The examinations in the three first-mentioned subjects can be taken separately, but a student must pass simultaneously in the last three The examination in these may not be taken, unless the candidate is already a registered medical practitioner, until the eighteenth term from matriculation and the lapse of at least 33 months from the date of passing the examinations for first B M

The whole of the work for second B M may be done in recognised institutions away from Oxford—e g, the London medical schools Alternatively, a student who has the necessary qualifications may spend the first 6 months in Oxford, during which time he receives instruction in general pathology, bacteriology, pharmacology and elementary medicine and surgery, and thereafter do a further 27 months' work elsewhere

Further details about the qualifying and higher medical and surgical degrees are to be found in the "University of Oxford Examination Statutes," and in a pamphlet entitled "Information concerning the School of Medicine &c.," both of which can be obtained from the Clarendon Press, Oxford Questions about entries for or exemption from responsions and the preliminary examinations should be addressed to the college authorities, though the dean of the medical school, the Museum, Oxford, will also give any assistance that is within his power.

College entrance scholarships are advertised each summer in special numbers of the *University Gazette*, which can be bought for a few pence through any bookseller. In addition, many valuable prizes, scholarships, and fellowships are awarded, details of which can be found in the Oxford University calendar.

It is very difficult to give an estimate of the expense of that part of the course which is passed in Oxford, as it varies very much in different colleges. The amount paid by the average student is about £80 a term, but many manage on less than this

The Radcliffe Infirmary

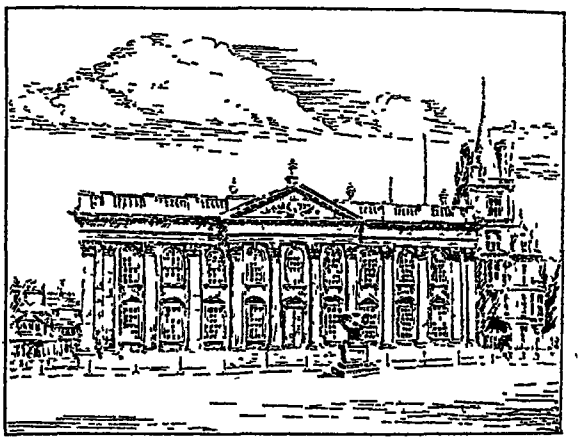
There are 506 beds, including 52 in the tuberculosis sanatorium and 30 in the recovery home Students preparing for the first B M examination receive instruction from the May reader in medicine at the infirmary in the clinical application of anatomy and physiology From September to March there is an annual six months' course in elementary medicine and surgery for students who have passed the first B M. and have qualified for the degree of B A. This course is associated with classes in pathology and pharmacology. Post-graduate courses are given twice yearly for panel practitioners under the Ministry of Health As a result of the Nuffield Benefaction departments of medicine, surgery, obstetrics and gynæcology, and anæsthetics have been established and the department of pathology and biochemistry is undergoing extension.

UNIVERSITY OF CAMBRIDGE

The University is a corporation which arranges facilities for study and confers degrees. The colleges, of which there are 17, are corporations distinct from the University, possessing and managing their own property, and for nearly all purposes independent of University control About 200 medical students enter the University every year Women are not admitted to membership but are instructed and examined by the University and may receive any of the degrees and diplomas open to men Before a student can begin his studies he must become a member of a college or of an approved foundation (Selwyn), or be entered as a non-collegiate student of Fitzwilliam House Application for membership of a college must be made to the senior tutor or head of the college Before admission the candidate must pass or obtain exemption from the previous examination and the college entrance examination, and most colleges require medical students to have passed or gained exemption from three or more parts of the first M B examination Application for admission should be made a considerable time beforehand

Cost of living varies greatly according to the tastes and means of the individual student, and the college of which he is a member. The average annual expenditure is about £300 Medical studies are endowed by the numerous natural science scholarships and prizes in ancillary subjects at the various colleges, information about which can be obtained from the respective tutors. Some of these are entrance scholarships and some are gained by students already in residence Mention may be made of the Tancred studentships in physic, tenable at Gonville and Caius College, the value of which is about £100 a year for 3 years.

After fulfilling college and University requirements the student is matriculated, that is, his name is enrolled on the register of the University. He must thereafter keep three academical years. The academical year begins in October and consists of three terms of about 8 weeks each. Medical students may also be required to be in residence for 6 weeks



(July and part of August) during the long vacation. A medical student cannot take his final examination until the eighteenth term after matriculating, which means that 6 years' study is required for a Cambridge medical degree

A student cannot obtain a medical degree unless he obtains honours in a tripos. Though a medical student may take any tripos almost all take the natural sciences tripos, Part 1. In this the student has to take three whole subjects or two whole subjects and two half subjects Considerable choice is allowed but the medical student usually takes anatomy and physiology as whole subjects because, if he reaches the standard required for medical degrees, he is exempt from further examination in these subjects. If he obtains honours but does not reach the standard required for medical degrees he has subsequently to take the qualifying examinations in anatomy and physiology. The half subjects most usually chosen are biochemistry and pathology, both of which are of great practical use later on.

It is possible for a student who has passed the first M.B before coming into residence to complete Part 1 of the natural sciences tripos in two years, and in that case he can take Part 2 in his third year. This entails a year's special study of one subject, the subjects most usually taken being anatomy, biochemistry, pathology, and physiology. During his time in Cambridge the student should also attend a course in pharmacology and pass the examination in that subject.

On leaving Cambridge the student proceeds to one of the recognised hospitals. It has always been the custom for students to seek clinical instruction away from Cambridge. At one time it seemed likely that a medical school for undergraduate clinical teaching might be established at Addenbrooke's Hospital, but the large number of students and the limited accommodation at the hospital have made that impossible, though a department of medicine has now been established which is making use of the material available at the hospital for clinical research and the training of young doctors in the methods of research

The final examination for medical degrees is in two parts: (1) surgery, including special pathology,

and midwifery and gynæcology, and (2) physic, pathology and pharmacology The examinations are partly in writing, partly oral, and partly practical Before sitting for Part 2 the student must have done two years and nine months of medical and surgical practice at one or more recognised hospitals and must have attended certain special courses The thesis which was formerly required for the M B degree has now been abolished and the student can proceed to the degree immediately after passing the final examination

Higher degrees—The degree of *Doctor of Medicine* may be taken by a graduate of the University of 8 years' standing who has passed the final M B examination An Act has to be kept, consisting of an original thesis with viva voce examination In some cases an examination is required in the field of medicine within which the thesis falls

Candidates for the degree of *Master of Surgery* who are Masters of Arts may be admitted to the examination after they have become legally qualified to practise Others may be admitted two years after they have completed all that is required of candidates for the degree of M B Candidates are required to pass an examination in surgery, surgical anatomy and operations, and pathology. The examination is held in February

Copies of the regulations and schedules of the range of the examinations may be obtained from the Registrary, the Registry, Cambridge Detailed information with regard to colleges, fees, and scholarships is given in "The Student's Handbook to the University and Colleges of Cambridge," published by the Cambridge University Press, price 7*s* 6*d*.

Addenbrooke's Hospital

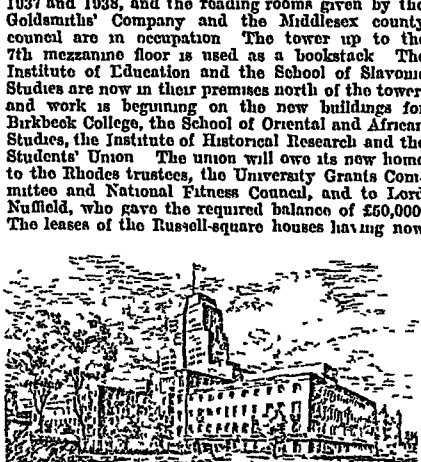
A department of medicine has now been established in the University with the reader in medicine and a group of whole time qualified research students working under the direction of the regius professor of physic The visiting staff of Addenbrooke's Hospital coöperate closely and afford full facilities for clinical study and research The work of the research unit is carried out in the medical wards of the hospital and in laboratories which have been allotted in the department of pathology Lectures and practical instruction in medicine are given by the regius professor and members of the medical staff to certain groups of senior students A few illustrative clinical lectures and demonstrations are also given to students taking the physiology course, and in the summer a course of lectures and demonstrations in applied pharmacology is given by the medical staff Regular staff rounds are held in the hospital, but there is no routine system of undergraduate clinical teaching It is open, however, to individual students to attend the ward rounds and out patient sessions of the physicians and surgeons by special arrangement Fortnightly clinical conferences in the evening are organised by the department of medicine, these are open to graduates, research students, and senior students in all the departments of the faculty

Fortnightly post graduate courses for general practitioners arranged by the Ministry of Health are held each year

The hospital has 316 beds, with the following resident staff Resident surgical officer; house physicians (2); general house surgeons (2), house surgeon to the special departments, resident anæsthetist and casualty officer

UNIVERSITY OF LONDON

Before the war a Royal Commission presided over by Lord Haldane reported that the University should have for its headquarters "permanent buildings appropriate in design to its dignity and importance, adequate in extent and specially constructed for its purpose, situated conveniently for the work it has to do, bearing its name and under its control" Attempts to acquire a site for the University were at first unlucky In 1912 a considerable sum was raised for the purpose but the scheme fell through, and when the Government offered the Senate the present Bloomsbury site in 1920 on condition that King's College moved from its position in the Strand, the authorities of King's College were unable to agree to the proposal and the offer lapsed In 1927, however, with the help of a gift of £400,000 from the Rockefeller Foundation, the Senate were able to purchase the ten-and-a half acre site to the north of the British Museum free of any conditions The foundation-stone was laid by H M King George V in 1933 and the Senate House was sufficiently advanced in 1936 for the administrative staff to be transferred during the long vacation The tower (210 ft high) was next completed and the flagstaff erected in July, 1937 The library was moved by stages in 1937 and 1938, and the reading rooms given by the Goldsmiths' Company and the Middlesex county council are in occupation The tower up to the 7th mezzanine floor is used as a bookstack The Institute of Education and the School of Slavonic Studies are now in their premises north of the tower, and work is beginning on the new buildings for Birkbeck College, the School of Oriental and African Studies, the Institute of Historical Research and the Students' Union The union will owe its new home to the Rhodes trustees, the University Grants Committee and National Fitness Council, and to Lord Nuffield, who gave the required balance of £50,000 The leases of the Russell-square houses having now



fallen in the site is being cleared for the ceremonial hall, for which the University will be indebted to the City corporation and most of the City companies, whose benefactions are to be commemorated by the display of their arms

All the metropolitan medical schools are constituent colleges while clinical units have been established at St Bartholomew's the London, St Mary's, St Thomas's, University College Hospital, and the Royal Free

The summary given below applies to the revised regulations for examinations to be held in 1940

Internal and external students—All the examinations of this University are open to men and women alike Matriculated students may be either internal

or external. Internal students are students who are registered as pursuing a prescribed course of study, or an approved course of research, in a school or under teachers of the University. Centres for preliminary and intermediate medical studies have been established at University and King's Colleges. External students in addition to matriculating must register as preparing for an examination leading to a degree or diploma within the purview of the council for external students.

Medical students of the University of London who are pursuing their medical curriculum in the metropolis will proceed to one of the recognised medical schools connected with the University described in detail in the next section. Students of St. George's, Charing Cross, and Westminster Hospitals take their preliminary and intermediate medical studies at King's College Students of the London Hospital usually attend Queen Mary College for the subjects of their first medical examination. Various schools and hospitals are also recognised as schools of the University in special departments, and students may pursue their studies at other approved universities and medical schools

The faculty of medicine of the University grants the joint degrees of M.B , B.S (*Bachelor of Medicine and Surgery*), the higher separate degrees of M D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*), and the degree of B.D S (*Bachelor of Dental Surgery*) and the degree of B.Pharm. (*Bachelor of Pharmacy*); the two higher degrees are open only to candidates holding the M.B , B.S. degrees of the University. The curriculum for the M.B., B.S degrees is five-and-a-half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University.

A revision of the medical curriculum has recently been carried out in view of a report submitted to the Senate by a conference of representatives nominated by the Universities of Oxford, Cambridge, and London, the English Royal Colleges, and the Society of Apothecaries.

A. *Internal students.*—For the Bachelor's degrees in medicine and surgery a student must normally, after registration as an internal student, have: (1) attended prescribed courses of study for five-and-a-half years in one or more schools of the University; (2) passed the following examinations, under the conditions mentioned below: (*a*) the first examination for medical degrees in inorganic chemistry, physics, including mechanics, and general biology; (*b*) the second examination for medical degrees in anatomy and physiology (including organic chemistry, biochemistry, and pharmacology); (*c*) the third examination for medical degrees, or M.B., B S. examination in medicine, surgery, obstetrics and gynæcology, pathology, hygiene, forensic medicine, and applied pharmacology and therapeutics

B. *External students.*—For the Bachelor's degrees in medicine and surgery an external student must (1) have passed the matriculation examination or have been exempted therefrom not less than five-and-a-half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five-and-a-half years subsequently to matriculation and four-and-a-half years subsequently to passing the first examination for medical degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four-and-a-half years to have been spent in one or more recognised institutions or schools in the United Kingdom.

Doctor of Medicine.—Candidates may present themselves for examination in one of the following branches—namely: (1) medicine; (2) pathology; (3) psychological medicine; (4) midwifery and diseases of women; (5) hygiene; and (6) tropical medicine. Any candidate may transmit to the registrar a thesis for approval and may be exempted from a part or from the whole of the written examination, and in the case of Branch II (pathology) also from the practical examination.

Master of Surgery.—The examination for the degree of mastery of surgery takes place twice in each year: (1) surgery; (2) dental surgery; (3) ophthalmology; (4) laryngology, otology, and rhinology. A thesis may be submitted as for M.D.

Doctor of Philosophy —A degree of Ph D. has been instituted in non-clinical subjects for internal and external students in the faculty of medicine Candidates for this degree must hold, in a branch of study akin to that in which they propose to proceed to the Ph D. degree, the degree of M.B., B S , or B.D.S , or B.Pharm , or B Sc.

Bachelor of Pharmacy.—This is a three years' course

Full details of the prescribed curricula can be obtained free on application to the academic registrar, University of London, the Senate House, W.C.1

University College

University College is a University centre for the teaching of medical sciences. The College faculty of medical sciences comprises the departments of physics, chemistry, botany and zoology (the preliminary medical sciences); also the departments of anatomy and embryology, physiology, biochemistry, and pharmacology (the intermediate medical sciences). Post-graduate and research work is undertaken in all departments. The completion of the building scheme by the erection of the section for anatomy, histology, and embryology, together with further extensions to the department of physiology, biochemistry, biophysics, and pharmacology, and the provision of new accommodation for the department of zoology, which the generosity of the Rockefeller Foundation made possible, provides exceptional facilities for research and post-graduate study. Arrangements exist for the close correlation of the work of the faculty with University College Hospital and medical school. The number of medical students is now 280, including 67 women students.

Scholarships —The first four items on the present list provide a complete intermediate course at University College, and, in the case of (*a*), the later clinical stages at University College Hospital. The money value and subjects at examinations are as follows: (*a*) Bucknill scholarship, £42 a year for five years, (*b*) and (*c*) two entrance exhibitions of £30 a year for two years, in chemistry, physics, biology, and an English essay; (*d*) entrance scholarship, £45 a year for two years, (*e*) Ferriere scholarship, £25 for three years, tenable at University College Hospital medical school, awarded to a student who has done his anatomy and physiology at University College and has completed the 2nd medical examination; (*f*) Sharpey physiological scholarship, about £112 a year (renewable); (*g*) Bayliss-Starling scholarship, £130 a year, in physiology and biochemistry; (*h*) two anatomy and/or physiology scholarships of the total value of £100 to enable students to spend an additional year at college in order to proceed to the B Sc degree; (*i*) Morris bursary for sons of deceased professional men, tenable for two years, £20 a year.

Composition fees —Course for first examination for medical degrees, 38 guineas; for second examination, 80 guineas (payable in two equal instalments). These

fees include the subscription to the University union society

For further information apply to the secretary, University College, Gower-street, London, W C 1

King's College

The medical faculty at this College of the University gives instruction in the subjects of medical science for all the usual premedical and intermediate examinations in medicine, surgery, and dentistry Through the four associated hospitals, students of the College have clinical facility of over 1000 beds

The medical faculty of the College, admitting approximately 120 new students each year, provides a general university education in touch with other faculties, whose classes medical students are permitted to attend There are many college societies, clubs, and functions, in which students of all faculties have opportunity of meeting each other, and the college athletic ground at Mitcham, with a new and well equipped pavilion, gives excellent facilities for all kinds of sport Inter-faculty competitions are a regular feature in the sporting life at the College

The first year subjects are taught in the large departments of the faculty of science and those for the second and third years in the new medical department, consisting of the Hambleden department of anatomy and an extension to the department of physiology, built at a total cost of £70,000 These new buildings and others of recent years provide the College with a completely new and modern medical department which embodies the newest ideas in laboratory construction and equipment Special facilities are given for taking science degrees in association with medical degrees, as is done in the universities of Oxford and Cambridge

Scholarships and prizes—Two Warneford entrance scholarships of £30 each for four years in divinity, English essay, classics, or science One Sambrooke scholarship of £30 for three years in English essay, classics, or science Worsley scholarships £100 in five annual instalments of £20 *At the end of the first year* of study, one Warneford scholarship of £30 for four years, subjects as for first M B plus divinity; the Rabbeth scholarships (£30 and £15) *At the end of the third year* students may sit for the several scholarships offered by each of the associated hospital medical schools Various prizes are awarded by the College to the best third year students The Layton and the Berridge research studentships (£150 and £100 per annum respectively) and the Daniell scholarship in chemistry (£40) are also open to students of this faculty

Fees—First M B or premedical, £40 per annum, second M B or first conjoint, £14 per annum, dental course, 60 guineas per annum, anatomy and physiology only for L D S, £23 2s per annum

For further information apply to the dean of the medical faculty, King's College, Strand, W C 2

Queen Mary College

In 1917 a working arrangement was come to between the Governors of the London Hospital Medical College and Queen Mary College (East London College as it then was) by which the latter undertook to provide instruction in the first M B and pre-medical subjects for the London Hospital The College (which had already been recognised as a School of the University of London in arts, science, and engineering since 1907) then included a faculty of medicine in its activities

Facilities for teaching physics, chemistry, and botany (plant biology) in both lecture rooms and laboratories were already in existence, but accommodation for zoology (animal biology) had to be provided This department is now housed in the third floor of the new west block which has recently been added (at a cost of £40,000) as part of the scheme for modernising the College buildings A new junior chemistry laboratory has also been added at the top of the chemistry block, and when the rearrangement of the physics department follows as the next part of the scheme the junior physics laboratory will be remodelled

The College, therefore, has now specially designed and well equipped lecture rooms and laboratories for students reading for the first M B London, the premedical examination of the Conjoint Board, and, if required, for the first M B examination of Cambridge University Although the majority of the students attending the College have been accepted for admission to the London Hospital Medical College students going to other medical schools will be admitted The number of medical students for the past five years has averaged just under 50 The College is now in a position to receive more, including women

At South Woodford the College has two Halls of Residence, Elmhurst for men and Lynden Hall for women Two years ago Dytchleys, an early Georgian manor house near Brentwood, was opened as the College club-house The house provides living rooms and common rooms for staff and students, changing-rooms, and a badminton court, and the 55 acre grounds provide ample playing fields

Fees—First M B and premedical (per session): for four subjects, £31 12s, for three subjects, £27 2s, for two subjects, £20 2s, for one subject, £12 First term revision medical course (per term) for four subjects, £16 4s, for three subjects, £13 4s, for two subjects, £9 14s, for one subject, £6

There are unfortunately no entrance scholarships for medical students at Queen Mary College, although there are scholarships for those going on from there to the London Hospital

A copy of the prospectus may be obtained post free from the registrar, and the dean for medical students will be pleased to see prospective students and advise them upon their courses of study

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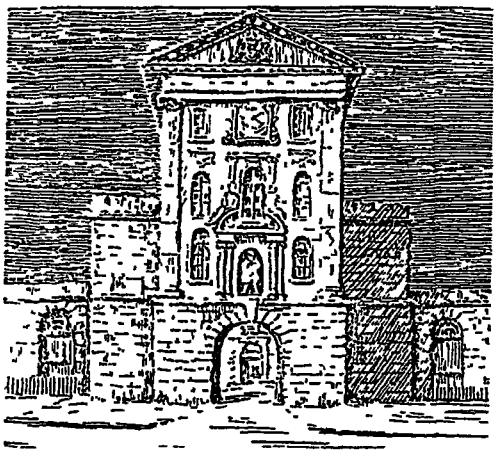
MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON

(*A map of the medical student's London appears on p 547*)

St Bartholomew's Hospital

The hospital was founded on its present site in West Smithfield by Rahere in 1123 in fulfilment of a vow he made in Rome during an illness, and the charter which he obtained from Henry II is still in excellent preservation. The hospital remained under monastic control until 1547 when Henry VIII took over its revenues, only to return them to the City of London three years later with a new charter. Students were attending the hospital in 1662, and in 1720 the governors provided them with a library, a museum, and a dissecting room By 1765 Percival Pott was delivering lectures on surgery (to John Hunter among others) and William Pitcairn on medicine The members of the staff at that time had their own private schools but about 1830 John Abernethy, whose fame as a teacher had attracted a large body of students including Benjamin Brodie and the poet Shelley, persuaded his colleagues to pool their resources In 1843 a residential college was

provided, and in 1870 the present school was built. In 1933 the medical college, which had obtained a charter of its own in 1921, acquired the site of the Merchant Taylors School in Charterhouse-square and the preclinical subjects have since been taught there.



The medical college now has about 750 students. It is hoped to build a students' hostel at Charterhouse-square when funds are available, but in the meantime the college uses the University Hostel, Connaught Hall, in Torrington-square, and the majority of students live in lodgings, mainly in Bloomsbury and Hampstead. The Students' Union, which incorporates the various games and other clubs, has common rooms and dining-rooms, a fives court, and a miniature rifle range at the hospital, and at Charterhouse-square there are squash courts, fives courts, cricket nets, and the college hall which is used for dinners, dances, and the like. The college has an athletic ground at Foxbury, near Chislehurst, with three rugby pitches, an association football and a hockey pitch, tennis-courts, and cricket pitches.

Students are admitted in October, January, or April, but the first is the best date. The school covers the whole medical curriculum, but students may enter (1) for the full course, (2) after passing an examination in chemistry, physics, and biology, or (3) for clinical work only. For stage (1) they must have passed the London University matriculation examination or its equivalent

Fees.—Entrance fee, £15 15*s*. Composition fees: (1) For full course, £231, or five instalments of £50 8*s*. (2) For those entering after passing the first examination, £199, or four instalments of £54 12*s*. (3) For those entering only for clinical work, £131 5*s*., or three instalments of £47 5*s*. Students' Union subscription, £21, or £12 12*s*. for those entering for clinical work only. Extra expenses: dissection, £3 10*s*., fever, £3 3*s*.; operative surgery, £4 4*s*.

Entrance scholarships.—(1) Combined scholarships, in association with Guy's and St Thomas's Hospitals, open to students who have passed in anatomy and physiology at a British university: (*a*) scholarship providing free medical education for three years; (*b*) exhibition of £60 in any two of the following: human anatomy and embryology, physiology, pathology and bacteriology, biochemistry. (2) Shuter scholarship of £50, in anatomy and physiology, open to Cambridge graduates. (3) Science scholarship of £100 in chemistry, physics, or biology. (4) Arts scholarships: (*a*) in mathematics; Latin or Greek or French or German, or chemistry or physics, value £100; (*b*) Jeaffreson exhibition, value £60, in the same subjects. (5) Helen Cave memorial scholarship in arts, value about £200, open to sons of medical practitioners.

Other scholarships.—There are scholarships open to undergraduates at various stages of their career to the value of about £500, and two B.Sc. scholarships of £50 with remission of fees for one year. In addition there are numerous research scholarships for post-graduates in medicine, surgery, pathology, and anatomy.

St. Bart's Hospital contains 845 beds, including 70 at the Alexandra Hospital at Swanley for surgical tuberculosis and orthopædic cases, and use is made of the City of London Maternity Hospital for obstetric work and the L C C hospitals for extra midwifery beds and for special courses of teaching. A hundred beds are set aside for medical and surgical professorial units under whole-time officers, who are also provided with laboratories for research

Non-resident appointments.—There are 44 six month appointments in the out-patient departments, paid at the rate of £80 per annum.

Resident appointments.—There are 21 resident appointments for six months, paid at the rate of £80 per annum, with board and lodging.

Clinical assistantships.—A large number of these are appointed for three months to the various departments

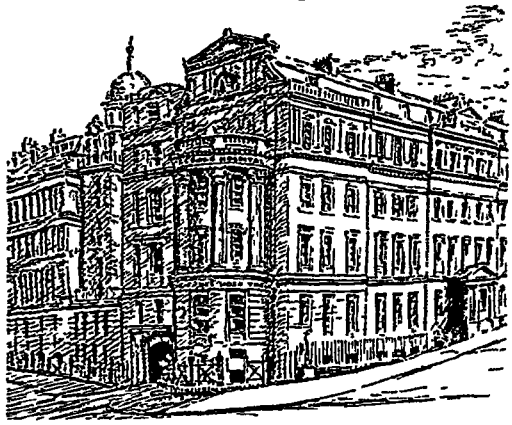
Demonstratorships.—Demonstrators are appointed in the college in biology, chemistry, physics, anatomy, physiology, biochemistry, pathology, medicine, surgery, and midwifery, at salaries from £150 to £750 a year

Chief assistantships.—Two or three chief assistants are appointed in each professorial unit at from £300 to £400 per annum, four medical and four surgical chief assistants are appointed yearly in the non-professorial units at £200 per annum; and each special department has a chief assistant

The *St. Bartholomew's Hospital Journal*, edited by students, is published monthly and obtainable from the college office.

Charing Cross Hospital

In 1815, when medical schools were mostly the private property of teachers, Dr. Benjamin Golding conceived the idea of providing students with wider education and experience by the foundation of an institution of university standard where scientific and practical instruction could be combined. His scheme also aimed at making good the deficiency in



provision for the sick poor of West London. Dr Golding began by opening his own house in St Martin's-lane to out-patients, but the accommodation there was soon outrun, and in 1823 an infirmary and dispensary was started in Villiers-street. Within 15 beds and a small number of students. Within eight years support for this institution had been so

great that a new site was acquired and the foundation stone laid of the present hospital The hospital was formally opened in 1834, with its new departure of a medical school in the same building

Students pursue their primary and intermediate studies at King's College, University of London From its inception the school has aimed at maintaining close personal contact between the staff and students, and to make this possible the number of students admitted is limited to 30 a year In this way overcrowding of classes is avoided, and during his appointment as clerk and dresser each student is responsible for at least six beds

There is no residential hostel attached to the school, but for those who do not live at home lodgings are easily obtainable There is a students' club at the school with a common room, facilities for badminton and squash, and a refectory The sports ground is at Colindale, half an hour by tube from the hospital, where there are pitches for rugby and association football, hockey and cricket, and hard tennis courts A pavilion has recently been erected, equipped with every modern convenience, including thermostatically controlled showers and an oak over-floor for dancing in the tea room

Fees—Entrance fee, £10 10*s* Preclinical course, see King's College Clinical course Annual fee, £30 18*s*, Students' Union subscription, £4 4*s* per annum, fevers, £3 3*s*, vaccinations, £1 11*s* 6*d*

Entrance scholarships—(1) Three scholarships of £65 awarded annually to students who have passed matriculation, on the nomination of the dean (2) Epsom College scholarship of £100, awarded periodically on the nomination of the headmaster (3) Cranleigh scholarship of £100, as above (4) Two university scholarships of £120, in anatomy and physiology and pathology (5) One university scholarship of £75, in anatomy and physiology (6) University exhibitions of £60, awarded periodically at the discretion of the dean

The hospital and school are in the centre of London, and access to them by tube, train, bus, or tram is unrivalled The hospital has 300 beds and is almost the only one of the teaching hospitals able to furnish its students with the number of cases required by the regulations for the examinations in midwifery During his course every student holds a clerkship in the pathological laboratories, where the exceptional facilities of the Institute of Pathology are available to him Special features of the instruction are the time devoted by the staff to teaching in the out-patient department, and the tutorial classes and weekly examination papers for students in their final year

Resident appointments.—There are 27 of these appointments to be filled each year, and as only 30 students are admitted annually there are very few unsuccessful applicants a consideration of great value in the training of the student The appointments are house physicians (3), house surgeons (3), obstetric and gynæcological house surgeon (1), house officers in special departments (4), casualty officer (1), assistant casualty officer (1), resident anæsthetist (1) These are for six months or one year, with salaries of £50–£200, with free board and lodging A resident medical officer is appointed annually at £350 a year with other fees.

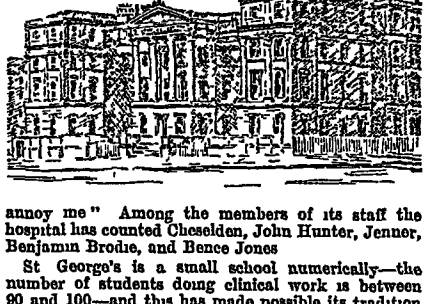
Non resident appointments—Clinical assistants in various departments for one year or longer, unpaid

Registrars—Eight are appointed annually in the medical, surgical, obstetric, ear, nose and throat, fracture and orthopædic and cancer and radium departments at salaries of £100–£150 a year

The *Charing Cross Hospital Gazette* is published quarterly by a students' committee, and obtainable from the editor at the medical school

St. George's Hospital

In 1733 some of the supporters of the Westminster Infirmary in Petty France decided to found a hospital in Knightsbridge, which was famous for its "good air for cure of consumptions, melancholy, and other infirmities," a reputation which is perpetuated in the name Constitution Hill They started their new hospital at Lanesborough House in the fields overlooking Hyde Park, and in this mansion it remained until the present hospital was built a hundred years later From its inception the physicians and surgeons were allowed to have a limited number of pupils, and from 1831 onwards lectures were delivered regularly in the hospital itself It was a difference of opinion with his colleagues as to the admission of certain students which led to John Hunter's death in 1793, and the fulfilment of his reported prophecy, "my life is at the mercy of any fool who choses to



annoy me" Among the members of its staff the hospital has counted Cheselden, John Hunter, Jenner, Benjamin Brodie, and Bence Jones

St George's is a small school numerically—the number of students doing clinical work is between 90 and 100—and this has made possible its tradition of personal instruction and friendly discussion between staff and students dating from the apprentice days There is no residential hostel but lodgings are easily obtained near Victoria for 35*s* a week The hospital club provides luncheon, smoking- and reading-rooms, and a miniature rifle range, and at Wimbledon there is an athletic ground with cricket and football grounds and six tennis courts

The preclinical subjects are not taught at the hospital, and those who enter in the first or second year of the curriculum take the necessary courses at King's College A large proportion of the students entering each year have already done their preclinical work at Oxford, Cambridge, or other universities

Fees—(*a*) At King's College: Registration fee, £1 1*s*; first year, £40 per annum, second year, £41 per annum (*b*) At St George's Clinical period, £42 per annum, club subscription, £3 13*s* 6*d* per annum Pharmacy, £3 3*s*, fever course, £3 3*s*, vaccination course, £1 11*s* 6*d*

Entrance scholarships—(1) Preclinical One scholarship, value £100, in English essay and any four of English, German, Latin, Greek, French, pure and applied mathematics, chemistry, physics, botany, biology (2) Clinical Eight scholarships, value from £50 to £120, and four exhibitions, value £40 Preference is given in one scholarship to candidates from Pembroke College, Cambridge

Other scholarships and prizes—These include a scholarship in surgery, value £85, prizes in medicine, surgery, and bacteriology, each valued about £33, and a research fellowship value £114

The hospital has 344 beds and there are a further 100 beds at the convalescent branch at Wimbledon which does much to relieve pressure on the hospital accommodation. The hospital and medical school are shortly to be rebuilt and enlarged, the hospital to contain 500 beds, the school to accommodate 150 students, but in the latter increase in facilities rather than increase in numbers is the aim In the new hospital the special departments which are cramped at present will chiefly benefit, in particular the in-patient' midwifery department, which will, it is hoped, provide the statutory number of cases per student without the necessity of going elsewhere. Psychiatric and modern children's and dietetic departments are to be added. It is emphasised that the proportion of students to beds will be kept as before

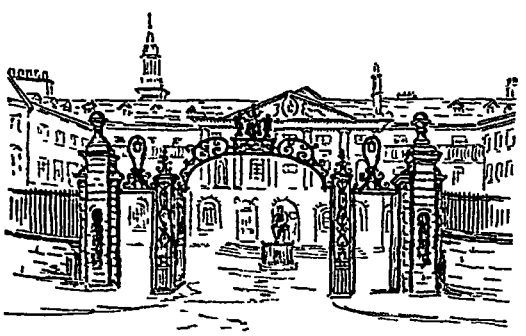
Resident appointments.—There are 4 casualty officers, 4 house surgeons, and 4 house physicians appointed for six months, and usually holding these appointments in succession. Two house surgeons in the ophthalmic and ear, nose, and throat departments are also appointed every six months These 14 officers receive free board and lodging and salaries of £40 a year In addition there is a resident obstetric assistant and a resident anæsthetist, both appointed for six months at salaries of £100 a year

Senior appointments—Resident assistant physician at £250, 2 surgical chief assistants at £200, an R M O. at the convalescent branch at £300, M.O in the biochemical department at £150, orthopædic registrar at £150, registrar to the children's department at £100, and obstetric registrar at £90 There are also registrars and clinical assistants in the various special departments

The *St. George's Hospital Gazette* is published four times a year and is obtainable from the editor at the hospital

Guy's Hospital

The first patients were admitted to Guy's on Jan. 6, 1725, ten days after the death of its founder Thomas Guy was a bookseller in Cornhill who, starting in a small way, acquired wealth first by obtaining from the University of Oxford a privilege to print Bibles and subsequently by shrewd investment in South Sea Stock. Guy's original building is now occupied mainly by the surgical wards. The hospital has since been steadily added to by numerous benefactors and now contains 691 beds and deals with nearly 100,000 out-patients annually. The medical school may be said to date from the resolution of



the governors in 1769 that the surgeons of the hospital should occasionally give lectures to the pupils entered at the hospital, and until 1825 there was free interchange of teaching between Guy's and St. Thomas's. In 1825 this union was dissolved and Guy's built an anatomical theatre, a museum, and a dissecting-room of its own.

At the present time there are 504 medical and 351 dental students, most of whom live either at home or in lodgings, especially in the neighbourhood of Forest Hill, and there is accommodation for 28 students at the college in Great Maze Pond opposite the east gate of the hospital. The college, which is run by a committee, also houses the resident house officers and the students' club. The latter includes a reading-room and library, two dining-rooms, and a gymnasium, and is open to all members of the clubs' union In addition there are two squash rackets courts in the hospital grounds and a swimming bath which students may use three days a week The hospital athletic ground is at Honor Oak Park and can be reached in about a quarter of an hour from London Bridge station Here there is a field for football, hockey, cricket, and athletics, with a covered stand to seat 600 people and a pavilion with dressing-rooms, tea-rooms, and so on, and there are also 13 grass and 3 hard tennis-courts The various clubs and societies of the medical school have been amalgamated into the clubs' union, and an annual subscription of five guineas covers membership of them all.

Fees—First year, £35; second and subsequent years, £49 per annum; instruction in fevers, £3 3*s*, clubs' union subscription, £5 5*s* per annum. Students entering for only the clinical period pay an entrance fee of £14 and an annual fee of £49.

Open junior scholarships—Entrance scholarship in arts, value £100, entrance scholarship in science, value £100; war memorial scholarship of £200, awarded every other year, alternately in arts and science

Junior science scholarship of £100 for students who have attended preliminary science classes at Guy's

Epsom scholarship, awarded annually to a boy from Epsom College, entitling the holder to free education for the 5½ years' course

University entrance scholarship of £100 and exhibition of £60, awarded annually on an examination held in common by St Bartholomew's, St. Thomas's, and Guy's Open to students who have completed their examinations in anatomy and physiology at a British university outside London

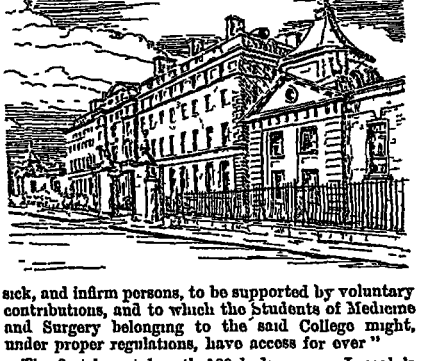
Resident appointments.—The following are usually held more or less in succession: assistant house physician (6), assistant house surgeon (4), out-patient officer (4), house surgeon (4), or house physician (4) The first three of these are for three months and the others for six. In addition there are the following more specialised appointments, each for six months: obstetric resident (3), house surgeon in the ear, nose, and throat department (2), the eye department (1), the genito-urinary and orthopædic departments (2), house physician to the children's (1) and the dermatological departments (1), and resident anæsthetists (2)

The *Guy's Hospital Gazette* is published fortnightly. There is a students' number in September, obtainable from the Gazette Office, Guy's Hospital, S E 1.

King's College Hospital

The hospital is one of the two in London which were founded primarily as teaching institutions in connexion with medical schools which were already in existence King's College itself was founded in 1829 and its medical faculty came into being a year later. At first the students obtained their practical instruction in the wards of existing hospitals in the neighbourhood, but as their number increased this arrangement became more and more unsatisfactory until ultimately, in the words of the college minute book, "the Council of King's College, finding that hospital practice in connection with, and in the

vicinity of, the said College was indispensable for the complete education of its medical students, did, in the year 1839, take measures for the formation, in the parish of St Clement's Danes, in the County of Middlesex, of a Public Hospital for the relief of poor,



sick, and infirm persons, to be supported by voluntary contributions, and to which the students of Medicine and Surgery belonging to the said College might, under proper regulations, have access for over "

The first hospital, with 120 beds, was in Lincoln's Inn fields, in the midst of what was then a densely thronged poor population, and its staff dealt, among other things, with the cholera epidemic of 1849 This hospital was succeeded by a far larger building on the same site in 1861, and here it was that Lord Lister developed his principles of antiseptic surgery In the next forty years the character of the neighbourhood changed, and it was decided to move the institution to a district which needed its services more Thus in 1909 the foundation stone was laid of the present building at Denmark Hill, which is near to Camberwell in South London

The medical school, which since 1909 has been managed entirely separately from King's College, now has 323 students Twelve women students are admitted each year to the final medical studies

Instruction in the preclinical subjects is given at King's College in the Strand, but the whole of the final medical course, with the exception of classes in infectious fevers, is provided at the school

The new school buildings opened by the Duke of Kent in 1931, include a refectory, common rooms, lecture rooms and research laboratories There is a hostel for men students within five minutes' walk of the hospital This is a large house with a good garden standing on high ground, and accommodates 75 students in bed sitting rooms at from £66 to £80 a year There are grass and hard tennis courts in the grounds of the hostel, and squash courts and tennis-courts at the medical school The hospital athletic ground on Dog Kennel Hill is within half a mile of the hospital, and here there are rugby, cricket, tennis, and hockey grounds

Fees—First year, £10, second and third years, £44 per annum final years £50 per annum or £130 for the 3 years' course (club subscriptions and special courses included)

Entrance scholarships—(1) *For the whole course* (*a*) three Warneford scholarships in arts value £120 (*b*) Sambrooke scholarship in arts or science value £90; (*c*) science scholarship, value £100 (2) *For clinical studies only* (*a*) two Raymond Gooch scholarships awarded on a report from the authorities of the candidate's college, value £105 each (*b*) two Burney Yeo scholarships awarded to candidates from Oxford or Cambridge on the recommendation of their respective Regius professors, value £105 each, (*c*) Epsom College scholarship, value £100, (*d*) anatomy and physiology scholarship, value £100, (*e*) pathology scholarship, value £100, (*f*) two Seaman scholarships for sons of Church of England clergymen, value £125 each

Resident appointments—Casualty officers (2), anæsthetists (2), radiologist (1), clinical pathologist (1), house physicians (4), house surgeons (10), total 20 These all receive free board and lodging and salaries

Non resident—Assistant casualty officers (6), clinical assistants (12) These posts are unpaid

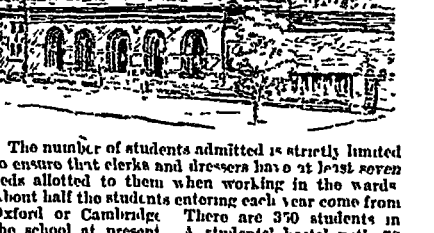
Registrars—Nine registrars at salaries of £250 per annum

The hospital now has 384 beds, but it was designed on a large scale and its ultimate accommodation will be 600 The ten boroughs south of the Thames are provided with only three large general hospitals, and of these King's, the farthest south, serves an immense number of people, hence the available clinical material is ample

The *King's College Hospital Gazette* is published quarterly and may be had from the editor at the hospital

The London Hospital

In 1740 seven men met at the Feathers Tavern in Cheapside and decided to found a hospital on a capital of 100 guineas They rented a house in Featherstone-street, near the Dog Bar, at £16 per annum, and thus became the first home of the "London Infirmary" Next year they moved to larger premises, engaged a nurse, and even admitted a surgical pupil The present site in Whitechapel road was leased in 1752, and the main building was completed by 1759 Additions were made as funds became available, and from its small beginnings the "London" grew into the largest voluntary hospital in England John Harrison, the first surgeon to the hospital, had lectured to students from very early days, but it was the enthusiasm and generosity of Sir William Blizard which led the governors in 1785 to set an example by erecting a complete medical school on the model of the medical faculty of a university In 1785 the Medical College was incorporated as a constituent school of the University of London



The number of students admitted is strictly limited to ensure that clerks and dressers have at least *seven* beds allotted to them when working in the wards About half the students entering each year come from Oxford or Cambridge There are 350 students in the school at present A students' hostel with 78 bed sitting rooms was opened by Queen Mary four years ago, and here board and rooms can be had for from 35s a week Other students have no difficulty

in finding satisfactory lodgings in the eastern area extending to Leytonstone and Chingford close to Epping Forest The hostel and college have squash, fives, and tennis-courts, and there is a 13-acre ground at Highams Park with provision for cricket, rugby and association football, hockey, and tennis Recently three tennis-courts, two practising wickets and a rugby scrum ground have been provided near the students' hostel. The hospital can be reached in 20 minutes by underground railway from Baker-street or Charing Cross

Students are admitted for the whole medical curriculum but those who have not passed their first M.B., although they become full students of the school, do most of their early work at Queen Mary College, which is close to the hospital.

The *fees* are as follows . entrance fee, £10 10*s* ; annual general fee, £48, clubs' union subscription, £5 per annum

Entrance scholarships—(1) Two "Price" scholarships of £100, in (*a*) the first M B subjects, and (*b*) anatomy and physiology, awarded in July (2) Two open scholarships of £100, awarded in April in two or more of the following : human morphology and embryology, physiology and pharmacology, biochemistry, pathology, bacteriology, and morbid anatomy (3) Epsom scholarship, open to students from Epsom College, providing a free medical education at the hospital

The hospital now has 891 beds and treats about 15,000 in-patients and performs about 8000 major operations a year. The out-patient department deals with 1400 out-patients every day ! This great size provides exceptional opportunities for students to acquire experience in clinical work, morbid anatomy, and the practical side of medicine in general. A special feature of The London is a medical clinical unit devoted entirely to teaching and research. In addition to the usual special departments there are departments of neuro-surgery, the surgery of the chest, cardiology, and cancer research, and a department of physical medicine All students, after serving a period in the wards, devote three months to a course in therapeutics which includes dispensing, applied pharmacology, medical and surgical nursing and the methods of physical treatment. Arrangements made with local maternity hospitals provide increased opportunities for students to learn the practice of obstetrics.

Appointments after qualification—The size of the hospital necessitates a large number of resident and non-resident house appointments and the chances of a student gaining at least one of these are considerable. There is no limit to the number of appointments which one man may hold, and a good student may be in succession clinical assistant in out-patients, house physician, receiving-room officer, house surgeon, house officer in a special department, and junior and then senior resident accoucheur. A student who holds all these appointments is a strong candidate for a first assistantship, and it is from the first assistants that the honorary staff is largely recruited.

Non-resident appointments—Clinical assistants to the surgical, medical, and special departments (32) The appointments are for three to six months and salaries range from £25 to £100 a year.

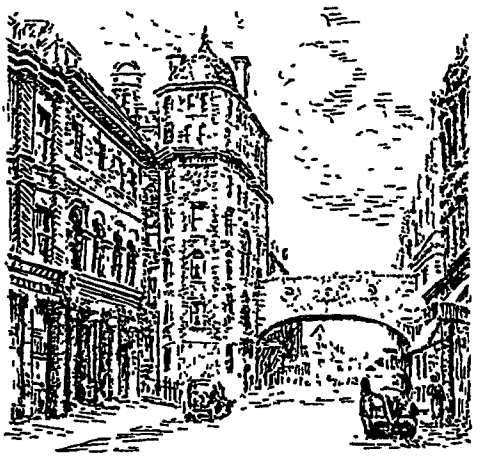
Resident appointments—Accoucheurs (2), receiving-room officers (7), house physicians (9), house surgeons (11), emergency officers (2) Appointments are for six months with free board and lodging.

First assistants (registrars) to the medical, surgical, obstetric, children's, and aural departments, appointed for three years at £250–£300 a year. A resident anæsthetist at £200, supervisor of minor operations at £200, assistants in the departments of pathology and bacteriology at £150 a year.

The *London Hospital Gazette* appears monthly in term time and may be had from the editors at the hospital.

St. Mary's Hospital

The origin of St. Mary's Hospital was due in large measure to James Lane, the anatomist The Prince Consort was interested in the project and in 1851 the hospital was thrown open ; the following year the first lecture was given in the medical school When a school is free to choose its teachers independent of the claims of its own students it usually follows that an exceptional staff is gathered together and for many years the staff at St. Mary's was out



standing. Cheadle, Edmund Owen, Sir William Broadbent, Sir Anderson Critchett, and Sir Malcolm Morris were members of a very fine teaching staff at the end of the last century But it is to the years since the war that St Mary's men will look back as a period in which the school has taken a leading part in educational policy : for example, in making use of the municipal hospitals (then known as poor-law infirmaries) ten years before such a practice became general, in the active support of the attempts to provide an academic career in medicine through professorial units ; in the provision of post-graduate courses for their old students (a movement that has now become general) ; and lately in taking a lead in raising the entrance standards.

The situation of the hospital and medical school is unique, for while it is adjacent to a large poor district with a population of 500,000, it is also within a few minutes' walk of Kensington Gardens and an extensive residential district, in which students can live in excellent rooms at a very reasonable cost and avoid a daily wearisome journey to and from their work A registry of approved rooms is published monthly for the use of students.

Soon after the war the authorities at St Mary's were struck by the contrast between the life of the average medical student before coming to London and after joining his medical school. With the exception of the first teams of the various clubs the vast majority of the students played no games at all Accustomed to some sort of exercise daily at their school or college they embarked upon a period of 3–6 years in which their exercise was often confined to the journey from their rooms to the hospital A prolonged attempt has therefore been made to get not only the man who is good at games but the great body of the students to take regular exercise The results have been remarkable. Almost a third of the students now belong to one club alone, and the number and quality of the junior teams is quite unusual For many years the condition of the sports ground

in winter—situated as the other schools' grounds were, on clay—detracted from the value of the winter games for some months The acquisition of the Old Merchant Taylors ground at Teddington (13 acres), which is on sand and remains dry throughout the winter, has completely transformed this state of affairs, and has been an immense asset in the provision of games for the junior teams

Approximately £250,000 have been spent in rebuilding the medical school and laboratories Apart from the laboratories, class rooms, and theatres for all subjects in the curriculum, they include a library, restaurant, students' club, billiards room, full sized swimming bath, squash rackets court, gymnasium, boxing ring, and an underground garage for 50 cars The school was formally opened by King George V in 1933 The number of beds in the hospital is now 476

In future only students who have passed, or obtained exemption from, the matriculation examination of a university can be admitted The number of full course students in the past year was 413

Entrance scholarships—All entrance scholarships are awarded annually in June by nomination The Geraldine Harmsworth scholarship (£200) and other university scholarships are open to members of Oxford and Cambridge Universities who have completed their examination in anatomy and physiology Scholarships open to the public schools to the value of £430 are also awarded annually

Fees—The composition fee for the entire curriculum is £205 and for the clinical portion 95 guineas The fee for the amalgamated clubs is 4 guineas a year

Resident appointments—Six house physicians (8 months), ten house surgeons (6–8 months), and four resident obstetric officers (6 months) are appointed annually Two resident anæsthetists (6 months) at £150 per annum, four casualty house surgeons (6 months) at £100 per annum, with board and residence

Non-resident appointments—Two medical registrars, a surgical registrar at £200 per annum with partial board, an obstetric registrar at £100 per annum, and a radium registrar at £50 per annum are appointed annually In addition five assistants to the medical and surgical units are appointed from time to time, with salaries ranging from £400 to £700 per annum

St Mary's Hospital Gazette is published ten times a year and may be obtained from the editor at the hospital

Middlesex Hospital

The hospital was founded in 1745 in Windmill-street under the presidency of the Duke of Portland In 1745 a majority decision to expand the hospital from its original 20 beds, to maintain it for general patients instead of limiting it to maternity cases as had been proposed, and to move to its present site, led to the resignation of the president and a number of governors Under the new president, the Earl of Northumberland, whose descendants have held that office ever since, the hospital grew steadily In 1702 Mr S Whitbread endowed a ward for cancer patients the first of its kind Similar endowments during the next hundred years culminating in that of the Barnato Joel trustees in 1909, established the hospital as the leading cancer institution in the country In 1925 the foundations showed signs of imminent collapse and it became necessary to rebuild the entire Middlesex In view of the increasing calls on the hospital's services it was decided that this should be done as thoroughly as the site would allow, and with the help of generous individual gifts it has been possible to erect a series of buildings which may be called a model of their kind

The medical school was founded in 1835, but teaching in the wards began in the earliest days of the hospital's existence, nearly 100 years before Moreover, the famous Great Windmill street School of Anatomy, founded by William Hunter, was taken over by Sir Charles Bell in 1812, and became virtually a school of the Middlesex Hospital of which Bell was, from 1814, one of the surgeons The school covers the entire curriculum and now has 387 general students It is now being rebuilt and the first of the three sections will be ready for occupation in September There is a residential college attached to the school with bed sitting rooms for 60 students and for the hospital resident staff, a common room, gymnasium, and squash rackets court The amalgamated clubs, of which each student becomes a member, have lately been given a new athletic ground at Chalehurst with ample space for cricket, rugby and association football, hockey, and tennis

Fees—Entrance fee, £15 15*s*, annual inclusive fee, £50 Clubs subscription, £5 5*s* per annum

Scholarships—Two entrance scholarships, one in arts and one in science, of £100 each Freer Lucas scholarship (Epsom), value £234 Edmund Davis exhibition (King's School, Canterbury), value £234 Two scholarships of £100 each for Oxford or Cambridge students Two scholarships of £100 each open to students of the medical school about to begin clinical work Two Broderip scholarships, value £60 and £40 The Lyell scholarship and medal, value £55 The Freeman scholarship, value £30 Other prizes are also awarded annually

There is now room in the hospital for 700 beds including 90 for cancer patients, although at present funds only allow the occupation of 614 beds There

are 60 beds for paying patients intended primarily for those of moderate means These patients have of course the benefit of all the hospital services The figures for 1938 show 315,000 out patient attendances, 9000 in patients, and an expenditure of £191,000 The recently opened Meyerstein Institute of Radiotherapy for the treatment of cancer by radium and X rays, complete with a four gramme radium unit, adjoins the cancer wards Both the compactness of the wing and the perfection of the equipment make it unique in this country

Resident appointments—House physicians (10) house surgeons (16), and gynæcological house surgeons (2) One senior and two junior resident anæsthetists are elected annually from among the students of the hospital who have qualified They are also eligible for the posts of

medical and surgical casualty officers and resident officers to the special departments The posts are held for six months The house physicians and house surgeons live and board in the residential college free of charge

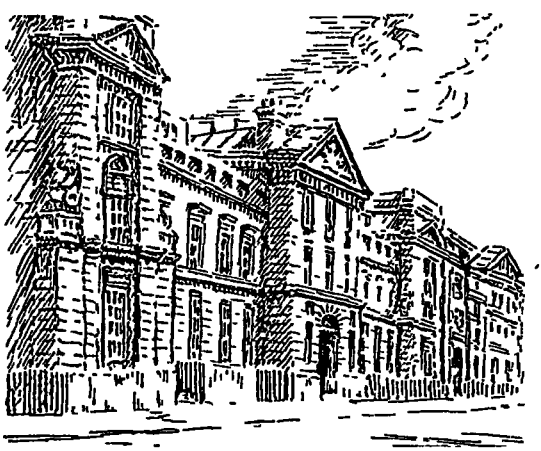
Non-resident appointments—Clinical assistants are appointed in the out-patient departments In addition registrars are appointed annually in the medical (4), surgical (4), obstetric (1), otological (1), fracture (1), and dental (1) departments They are eligible for reappointment up to three years

Middlesex Hospital Journal is published six times a year and may be obtained from the editor at the medical school

Royal Free Hospital

LONDON SCHOOL OF MEDICINE FOR WOMEN

The school was founded in 1874 by Dr. Sophia Jex-Blake A small house was taken in Henrietta-street (now Handel-street), Brunswick-square, and with the support of Dr Elizabeth Garrett (Anderson), Mrs Thorne, and other friends, teaching classes were opened there with 14 students. At first no hospital would provide clinical instruction for women and no qualifying body would admit them to examinations It was not until 1877 that an agreement was made by which the Royal Free Hospital was united with the school to provide the necessary hospital practice, and in the same year the University of London opened all its medical degrees and honours to women By this time there were 34 students who had completed the three years' curriculum at the school and were ready to begin clinical work. Since then the school has steadily gone forward. In 1874



there were only two women on the Medical Register—Dr Elizabeth Blackwell and Dr Elizabeth Garrett Anderson—to-day there are over 6000, of whom about 1800 were educated at the school, and there are 375 students undergoing training

The medical school covers the whole curriculum but a limited number of students are admitted for the clinical years only The various social, athletic, and other clubs at the school have been amalgamated into the students' union, and an annual payment of £3 3*s* covers the subscriptions of them all Common rooms, dressing-rooms, and so on are provided at the school and at the hospital, and meals can be obtained at moderate prices at the school refectory and hospital dining-room There are sets of residential chambers which accommodate 52 students in Tavistock-square, Gordon-square, and Brunswick-square, and other students live in the University of London hostel, College Hall, in Malet-street

Fees.—Annual inclusive fee, £50. Students entering only for the clinical course pay an entrance fee of £25.

Entrance scholarships—The following are awarded on an examination in arts or science: (*a*) two scholarships of £30 a year for six years, (*b*) exhibition of £60 a year for three or five years; (*c*) scholarship of £50 a year for three or five years, (*d*) scholarships of £90 a year for five years and of £20 a year for four years are awarded on the results of entrance examinations. The following are awarded to students who have passed or are taking the course for the London First M B examination (*e*) bursary of £50 a year for three years, (*f*) two scholarships of £75 a year for four years, (*g*) scholarship of £37 a year for four years; (*h*) scholarship of £25 a year for four years Two scholarships are open to those who intend to become missionaries There are many scholarships open to students during their clinical years and to post-graduates.

The Royal Free Hospital has 327 beds, and there is a large midwifery district worked from the Duchess of York Maternity Clinic and from the Elizabeth Garrett Anderson Hospital. Clinical instruction is also given at the South London Hospital for Women, the Cancer Hospital and elsewhere, and students may hold clerkships at the National Hospital for Nervous Diseases, the Central London and Royal London Ophthalmic Hospitals, and at the Children's Hospital, Great Ormond-street.

Resident appointments—House physician (3), house surgeon (4), anæsthetist (2), pathologist (1), obstetric house surgeon (3), held for six months with free board and lodging

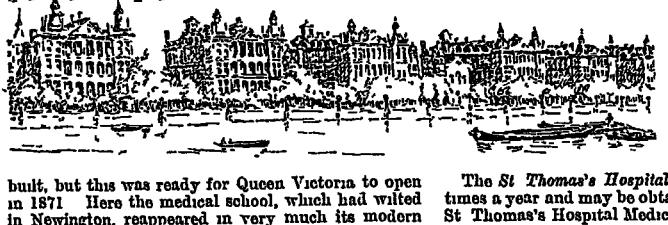
The *London (R F H) School of Medicine for Women Magazine* is issued three times a year

St. Thomas's Hospital

Many years before Becket was born the hospital which was to be given his name had its origin in the infirmary of the religious house which stood on the present site of Southwark Cathedral. Certainly by 1106 the monks were there caring for sick people besides those within their own walls Thomas Becket added a new infirmary to the old priory and this was named St Thomas's Spital after him In 1213, after a disastrous fire, King John published an appeal for funds beginning. "Behold at Southwark an ancient spital, built of old to entertain the poor, has been entirely reduced to cinders and ashes" On the proceeds of this appeal the whole priory was rebuilt at the opposite side of the Borough High street where it remained until 1862 The hospital was closed in 1540 by Henry VIII but was reorganised, endowed, and reopened by Edward VI in 1553 The old monastic hospital lasted until the end of the seventeenth century, when the grand committee suggested rebuilding it, and it was as part of this rebuilding scheme that Thomas Guy came to erect what was primarily intended as an overflow hospital for incurables and lunatics on the other side of St. Thomas's-street

During the seventeenth century, and probably some time before, the surgeons of the hospital took apprentices and had "skillet carriers," the forerunners of dressers, and by 1750 dressers were fully recognised. Lectures on anatomy and surgery were given by Cheselden as early as 1711. In 1725, when Guy's began to take pupils, the two Southwark schools combined their teaching and were known as "The United Hospitals" and this association lasted until differences of opinion on the appointment of the staff ended it in 1825. In 1859 the South Eastern Railway Company announced its intention of extending its line through the gardens of the hospital as

Parliament overruled the governors' opposition but made the company buy the whole hospital site for nearly £300,000 For nine years the hospital lived in a disused menagerie in Newington while the new hospital on the Albert Embankment was being



built, but this was ready for Queen Victoria to open in 1871 Here the medical school, which had wilted in Newington, reappeared in very much its modern form Various additions have since been made and the hospital now has 644 beds

Owing to the munificence of the late Mr Michael Herbert the medical school was largely reconstructed in 1932 There are now 360 students, 60 of whom are housed in the residential hostel immediately opposite the hospital Here at St Thomas's House is a fully equipped club with dining, smoking, and billiards rooms, and close by there are squash courts, a hard tennis-court, a gymnasium, and swimming bath The amalgamated clubs' ground is at Chiswick, where there are ample facilities for football, cricket, and tennis In addition there are opportunities elsewhere for boxing, rowing (at Putney), fencing, swimming, golf, rifle shooting, and sailing

The majority of students begin their work in October, but those who have done their preclinical work may equally well join in January, April, or July Those entering for the full course must have passed the London matriculation or its equivalent, and those who enter for clinical work only must have passed in anatomy and physiology

A close liaison exists between St Thomas's Hospital medical school and Lambeth Hospital, where students are allowed to attend the ward rounds and clinical work of the hospital In addition, two students at a time throughout the year spend a fortnight in residence at St James' Hospital, Balham, where they follow, and take part in, the maternity work of the hospital

Fees—Entrance fee, £5 5s , annual fee £50 , amalgamated clubs' subscription, £5 5s per annum Extra expenses dissection, £3 3s , fevers, £3 3s

Open scholarships in natural science—Two scholarships in physics, chemistry, and biology, value £150 and £60

University scholarship and Hector Mackenzie exhibition—These are awarded on an examination held in combination with Guy's and St Bartholomew's They are open to students who have completed their examinations in anatomy and physiology outside London Value £150 and £60

Foord Calger exhibition—Awarded on an examination either in the first M B subjects, in anatomy, physiology, or pathology Value £40 per annum for a maximum of five years Preference is given to candidates from Westminster School

Other scholarship—Two scholarships are awarded to enable students to work for the London B Sc examination for a year after passing the Second M B , Part 2 The Anderson scholarship value £35 may be used for the same purpose or for travel Scholarships are also awarded on the results of the sessional examinations for second and third year students and there are a number of scholarships for senior and qualified men Two special prizes are awarded to encourage work in psychological medicine

Non resident appointments—A number of clinical assistants are appointed to the special departments every three months

Resident appointments—There are 26 six month resident appointments, with free board and lodging

Senior appointments—There are a number of these which become vacant from time to time are held for from six months to four years, and carry salaries ranging from £150 to £600 per annum

The *St Thomas's Hospital Gazette* is published six times a year and may be obtained from The Librarian, St Thomas's Hospital Medical School, S E 1

University College Hospital

In 1825 a letter from the poet Thomas Campbell appeared in the *Times* advocating a university of London to provide advanced education without the religious tests and distinctions which then surrounded the older universities The outcome of this letter was the formation of a body of proprietors who were incorporated in due course as the "University of London," and the erection of buildings which were opened in 1828 as University College A faculty of medicine was part of the founders' original scheme, and medical classes were held at the college from its earliest days To provide opportunities for clinical work the University Dispensary was started in 1828 in George street and staffed by the teachers of the college, but this was soon found to be inadequate and five years later a beginning was made with what was at first called the North London Hospital and later University College Hospital, immediately opposite the college buildings

The foundation of King's College in 1829 introduced a complication into the question of a University of London, but after long negotiations a new examining body was incorporated in 1836 to which University College surrendered its title of university, and to which it and King's College were affiliated In 1898, when the university was reconstituted, it was decided to incorporate University College in the university and to continue the preliminary medical studies there, but to carry on the hospital and clinical teaching separately

The school provides for the admission of 80 students a year, 12 of whom are women and men students may have done their preclinical work at University College or at any other recognised school Eight of the women admitted are, however, nominated by University College, the other four vacancies being filled by annual competition There is a hostel for students immediately next to the school, and others live at University College Hall, Ealing, which is within half an hour of the college by train There are two squash rackets courts in the school and at Perivale a 28 acre ground for cricket, tennis, rugby and association football, and hockey

Fees—Preclinical years see University College

For the final examinations of the Universities and Conjoint Board inclusive fee £45 per year for three years

Oxford and Cambridge students who have completed their course in pathology £40 per year for three years

Entrance scholarships—(1) Two Goldsmid scholarships covering the cost of the final course of medical study. (2) One Goldsmid exhibition of £80 (3) Fillıter scholarship of 50 guineas in pathology

Other scholarships—(1) Three Magrath scholarships of about £50 each for proficiency in reporting clinical cases (2) Atchison scholarship of £55 a year for two years,

for general proficiency (3) Atkinson Morley surgical scholarship of £45 a year for three years (4) Fillıter exhibition in pathology, value £30.

Post-graduate scholarships and fellowships.—(1) Radcliffe Crocker travelling scholarship for the study of dermatology, value about £280. (2) Percival Alleyn scholarship for the advancement of surgery by research, value about £300 (3) Leslie Pearce Gould scholarship of about £260. (4) Bilton Pollard fellowship of £650

The present hospital and school of final medical studies were built 30 years ago, and since then the Royal Ear Hospital and the Obstetric Hospital have been added and the National Dental Hospital joined to the school More recently the hospital has benefited through a magnificent grant from the Rockefeller Foundation, which selected it as offering the best opportunity in the British Isles to put medical education on a modern basis.

University College Hospital itself has 414 beds, the Obstetric Hospital 85, the Royal Ear Hospital 41, and the paying patients' wing 77.

Resident appointments—House physicians (8), house surgeons (5), house surgeons to the Royal Ear Hospital (2), and obstetric house surgeons (3), appointed by competitive examination for periods of six months Receive free board and lodging but no salary. Resident medical officer at £200 a year and other fees

Non-resident appointments—Casualty surgical officer and casualty medical officer at £225 a year; house anæsthetist and obstetric hospital anæsthetist at £100 a year; clinical assistants in the V.D. department (5) and infant welfare department (2) at £100; assistants in other departments (6) at £250 a year.

Registrars and assistants in units.—Registrars in the medical, surgical, obstetric, ophthalmic, anæsthetics, and cancer departments, and at the Royal Ear Hospital, at £100–£400 a year. Assistants in the medical, surgical, and obstetric units (12) at £250–£900 a year.

University College Hospital Magazine is issued six times a year and can be obtained from the editor at the medical school

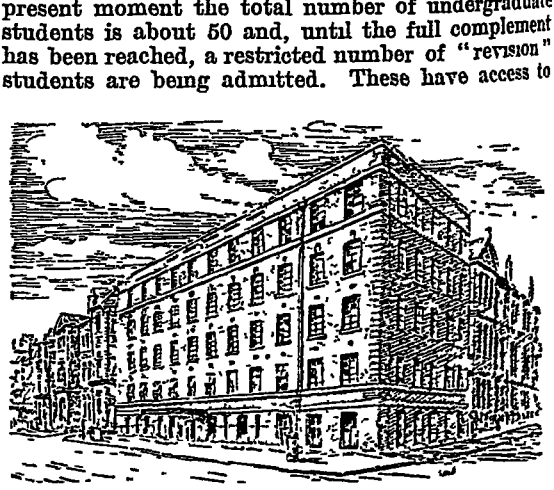
West London Hospital

The medical school is the youngest in London, having started as recently as October, 1937. Hitherto the hospital had been a centre for post-graduate study for some forty years and its Post-Graduate College was the leading institution of its kind in London until the formation, three years ago, of the British Postgraduate Medical School at Hammersmith

The West London Post-Graduate College did not wish to enter into competition with its publicly controlled neighbour and, after consultation with the University of London, it was decided that its facilities could most usefully be employed as a medical school to which the admission of women should be a prime consideration. Steps were accordingly taken to obtain recognition for this purpose from the universities and other examining bodies, and the school has now been recognised as a clinical school for students reading for the medical degrees of the Universities of Oxford, Cambridge, and London, and for the diplomas of the Conjoint Board and the Society of Apothecaries Recognition for students of other universities is sought when required and has never been refused.

As far as the University of London is concerned the school has not yet been admitted to the full status of a "School of the University" but it is hoped that the West London may soon be granted this further recognition. At present the students come under the purview of the Council for External Students but this makes no difference to the course of study; the regulations for internal and external students in medicine are identical.

It is proposed to admit not more than 24 students annually, making a total of approximately 70 for the three years' clinical course All students must have passed their Second M B. examination (anatomy and physiology or its equivalent) before admission The school is open to men as well as women but preference is given to women, and all students, except in very special circumstances, will be required to read for one of the university degrees At the present moment the total number of undergraduate students is about 50 and, until the full complement has been reached, a restricted number of "revision" students are being admitted. These have access to



all the clinics but do not hold any regular appointments and do not, therefore, interfere with the work of the undergraduates.

The school has leased from the hospital two adjacent and intercommunicating houses on the hospital property (1 and 3, Wolverton-gardens) Here are situated the offices, students' cloak-rooms, library, and certain other rooms which form the nucleus of a students' club At present there is no residential hostel but there is ample accommodation in the immediate neighbourhood which is largely residential in character. It is hoped that it will be possible to provide some sort of restaurant

facilities in the medical school buildings quite soon In the meantime the Hammersmith road can supply eating houses to suit all tastes and purses

Until the number of students has increased, the facilities for corporate sport will necessarily be somewhat restricted A students' union has been formed and its committee is actively engaged in negotiations for the provision of outdoor sports An arrangement has already been made for the use by students of the two squash courts at Latymer Court (2 minutes from the hospital)

The *fees* have been fixed at £50 per annum The question of an entrance fee is under consideration As the school has no endowments it is not yet possible to offer any scholarships

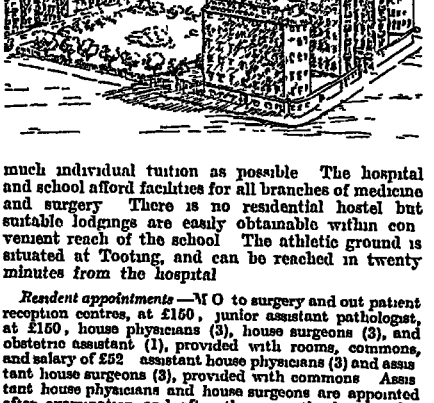
The hospital contains 239 beds and admits some 4000 patients every year The out patient department is exceptionally large and deals with over 43,000 new cases each year while the annual attendances exceed a quarter of a million All the special departments are provided for and the hospital has recently established special clinics for the treatment of injuries and for rheumatic diseases, being the first general hospital in London to do so The midwifery training is done at the West Middlesex (County) Hospital at Isleworth, where there is sufficient material to provide every student with 40–50 personal cases in the two months which is spent there

Resident appointments will be available to students of the school on qualification and a fair proportion of these will be open to women Senior appointments will also be given to old students when suitable applicants are available

Westminster Hospital

The foundation of Westminster Hospital dates back to the beginning of the eighteenth century at which time London had but two general hospitals, St Bartholomew's and St Thomas's In 1715, four gentlemen met at St Dunstan's Coffee House, Fleet-street, to form a "charitable society" One of these, Henry Hoare, was chiefly dominant in providing the funds with which the charity began, and his name is commemorated in perpetuity by a ward, whilst his successors as bankers have had charge of the hospital funds down to the present day In 1720, a house in Petty France was hired and an inscription in gilt letters reading "Infirmary for the Sick and Needy" was placed on the front and a staff of a matron, a maid servant and a messenger was engaged In 1724, a larger house was taken on the east side of Great Chapel street In 1770, five houses in James street were adapted for use as a hospital In 1831, the site in Broad Sanctuary was purchased from the Treasury where the hospital remained until it was lately removed to St John's-gardens, Horseferry road The new hospital, officially opened by the King in May of this year, has 403 beds, including 43 private beds, with all modern requirements Close at hand is the nurses' home and the medical school, thus removing the old difficulties resulting from geographical separation and the annexe devoted to radium therapy and research The number of in patients averages 5000 and of new out patients upwards of 30,000 a year

As early as 1734, apprentices were appointed to the members of the staff but it was not until about 100 years later that the medical school proper began in Dean street, later to be removed to Caxton street where it suffered from increasingly inadequate accommodation The new school, opened in May, 1938, contains a squash rackets court, gymnasium, refectory and common rooms, and above these, the library, museum, class rooms, and laboratories There is also a room specially reserved for the use of old Westminster students Preclinical work is done at King's College, Strand, as before, and the number of clinical students is limited to 120 to ensure as



much individual tuition as possible The hospital and school afford facilities for all branches of medicine and surgery There is no residential hostel but suitable lodgings are easily obtainable within convenient reach of the school The athletic ground is situated at Tooting, and can be reached in twenty minutes from the hospital

Resident appointments.—M O to surgery and out patient reception centres, at £150, junior assistant pathologist, at £150, house physicians (3), house surgeons (3), and obstetric assistant (1), provided with rooms, commons, and salary of £52 assistant house physicians (3) and assistant house surgeons (3), provided with commons Assistant house physicians and house surgeons are appointed after examination and after three months become full house physicians or house surgeons for six months

Non-resident appointments.—Chief assistants and registrars in medical (3), surgical (3), obstetrical (1), orthopædic (1), ear, nose and throat (1), radiological (1), and children's (1) departments at salaries of £100–£250 Two M O 's to surgery and out patient department at £200 House anæsthetist, appointed for six months, at £100 a year Clinical assistants to all departments, unpaid

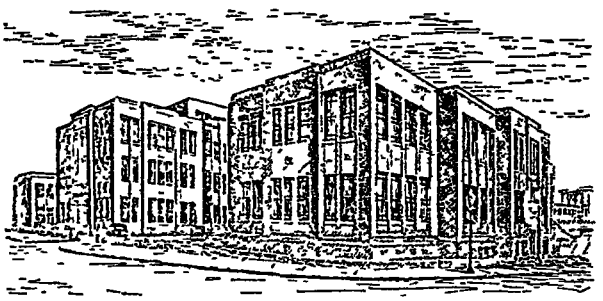
The Broad Way is published four times a year and is obtainable from the business manager at the medical school, 17, Horseferry-road, S W 1

" The customary procedure in filling an academic position is to inquire concerning a prospective candidate from his present and past superiors Since nearly everyone tries to appear at his best in the eyes of his chief, the professors and associate professors often have a false idea of a man's abilities Why not inquire of his inferiors also ? They see him as he is The house staff of a teaching hospital can usually 'size up' the members of the permanent staff as well and sometimes better than the chief can No man should be seriously considered for academic advancement unless he has the respect—not only of his superiors but also of his inferiors The old saying that 'Young men think old men are fools, but old men know young men are fools' is only partly true, but in any case, young men usually know which other young men are fools In a world of crumbling standards the safest assurance for the future of academic medicine lies in the thoughtful selection of the best possible young men Our choosing should be tempered by the sober recollection that each corporal should with justice carry in his knapsack the baton of a marshal "—T R Harrison Presidential address to the American Society for Clinical Investigation *J clin Invest* July, 1939, p 469

UNIVERSITY OF DURHAM

THE MEDICAL SCHOOL, KING'S COLLEGE, NEWCASTLE-UPON-TYNE

The University and its colleges have recently been reconstituted by statutes made by the commissioners appointed under the University of Durham Act, 1935. The University is divided into a Durham and a Newcastle division The former comprises the several colleges at Durham and the latter includes what was formerly called the University of Durham College of Medicine and Armstrong College, which are now merged into King's College, Newcastle-upon-Tyne. The medical school was founded in 1834, when the Barber-Surgeons Hall in Newcastle was



fitted up for the purpose In 1852 a new school was built on a site now occupied by Bolbec Hall in Westgate-road, and became associated with the University of Durham In 1885 new buildings were erected in Northumberland-road, where the medical school remained up to 1938 Now a much more commodious building in Queen Victoria-road has been built and was officially opened by the King in February The new premises, furnished and equipped in the most up-to-date manner, are opposite the Royal Victoria Infirmary and adjacent to the main buildings of King's College

During the past three years the average number of full-time undergraduate students has been about 400, of which about 80 per cent come from homes within 30 miles of the college, 15 per cent from the rest of the British Isles, 3 per cent from other parts of the Empire, and 2 per cent from foreign countries The social interests of students are well catered for in the University Union close to the college, and the athletic ground is within easy reach of the school and provides facilities for cricket, association and rugby football, tennis, and hockey.

Admission —Before entering the medical school the student must pass or gain exemption from (*a*) matriculation, in English, mathematics, French or German, Greek or Latin, and a fifth optional subject, (*b*) the premedical examination, in chemistry, physics and biology The course for (*b*) may be taken either in King's College or at certain other approved institutions Intending students should apply to the dean for the conditions of exemption

Entrance scholarships —The University medical scholarships of £25 a year for 4 years awarded annually, and the Pears scholarship of £40 a year for 3 years awarded every third year are awarded on the results of a special examination held in March each year The Heath entrance scholarship for boys from Kepier Grammar School, and the Province of Durham Masonic entrance scholarship, both value £60, are awarded annually and are renewable Other scholarships worth £5–£45 are awarded annually to undergraduates Post-graduate scholarships of £25–£200 are awarded in medical, surgical, and dental subjects, and grants are available for research

Qualifying examinations —For the degrees of M B, B S, students, in addition to the first (premedical) examination, must pass the second examination in anatomy and physiology, materia medica, pharmacology and pharmacy; the third examination in pathology, bacteriology, public health, and medical jurisprudence; and the final examination in medicine, surgery, midwifery and gynæcology, psychological medicine, ophthalmology, diseases of the skin, of the ear, nose, and throat, and of children At least 3 years must be spent in residence in the University In certain cases candidates may obtain exemption from the first and second examinations The length of the curriculum proper is five years

Fees and cost of living.—The total tuition fees for the complete course under the new regulations will be approximately as follows: for the M B, B.S, £230, for the B D.S, £225; for the L.D.S, £185 These fees include £35 for the first year premedical course In addition there are incidental fees for the students union, library, for board at the maternity hospital, and so on, amounting in all to about £50 (payable at various times throughout the course) Students from a distance have resided in the past in lodgings in Newcastle, but arrangements can now be made for a limited number to live in the college hostels at about £2 a week

Associated hospitals —(*a*) Royal Victoria Infirmary, with over 700 beds and annual out-patient attendances of 375,000. This provides for undergraduate and post-graduate clinical instruction in medicine and surgery and in the work of the special departments (*b*) Princess Mary Maternity Hospital, with 90 beds, for instruction in clinical midwifery. (*c*) Fleming Memorial Hospital for Sick Children (*d*) Newcastle upon-Tyne General Hospital (*e*) City Hospital for Infectious Diseases (*f*) City Mental Hospital (*g*) Newcastle-upon-Tyne Dental Hospital, with over 15,000 operations a year.

Higher degrees —For the degree of *Doctor of Medicine* the candidate must have obtained the M B of the University and have been engaged for at least 2 years subsequently in research or hospital work, the medical services, or in practice A candidate may either present an original essay on an approved subject or pass a special examination in medicine.

For the degree of *Master of Surgery* the general conditions are similar to those for the M D, and the degree is granted after a special examination

For the degree of *Doctor of Surgery* the candidate must have devoted 3 years (not necessarily consecutive), after obtaining a registrable qualification, to the study of surgery One at least of these years must be spent in the University and not less than 6 months in surgical study abroad He must present an essay on an approved surgical subject and pass an examination

The University also confers degrees of *Bachelor* and *Doctor of Hygiene*, and *Doctor of Philosophy*, and diplomas in public health and psychiatry.

Further information about courses and degrees can be obtained from the dean of medicine, the medical school, Newcastle-upon-Tyne

Royal Victoria Infirmary, Newcastle

The infirmary has over 700 beds. Clinical lectures are delivered by the physicians and surgeons weekly and ward demonstrations are given daily. Tutorial classes are given by the assistant physicians, assistant surgeons, the medical and surgical registrars, and the assistant to the gynæcological department, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are

given by the pathologist daily or as opportunity occurs In addition to medical and surgical in patient and out patient departments the following special departments are fully equipped for teaching ophthalmic, throat, nose, and ear, skin, gynæcological orthopædic, and electrical There are seven operating theatres in use in the hospital

Assistants in the pathological and other special departments and clinical clerks and dressers are appointed periodically Resident appointments are also made every six months, and each year medical and surgical registrars (who also act as tutors) are appointed from candidates who have previously held resident appointments at any recognised hospital These latter posts afford an excellent opportunity for post graduate study Detailed information may be obtained from the dean of the medical school

UNIVERSITY OF BIRMINGHAM

The medical school has been in existence over 100 years, and includes both medical and dental students The total number of students is now about 450, women being accepted as well as men Recently the school has been running at full capacity, and it has been necessary to restrict admissions When selection has to be made, priority is given to those students who are resident in the midland counties and who are taking a university degree The new medical school buildings adjoin the Queen Elizabeth Hospital, Edgbaston, on the Hospitals Centre site

Degrees of Bachelor of Medicine and Surgery—For the degrees at least three years must be spent in attendance upon classes in the University The final year may be spent at any other medical school recognised by the University The normal requirements for entrance for degree courses are (1) a school certificate, and (2) a pass in four subsidiary subjects in the higher school certificate examination taken at one time, or, alternatively, a full higher school certificate in any subject A candidate who obtains a higher certificate in the three principal subjects of chemistry, physics, and biology, may be exempted also from the first year courses and examinations The entrance regulations may be obtained from the secretary, Joint Matriculation Board, 315, Oxford-road, Manchester, 13

There are five examinations for the M B, Ch B degree The Senate may recognise courses of study and examinations at other universities for exemption from the first examination The examinations are as follows *First examination* chemistry, physics, and biology *Second examination* anatomy and physiology *Third examination* general pathology and bacteriology *Fourth examination* (at the end of the fifth year) forensic medicine and toxicology, public health, and materia medica, pharmacology, and therapeutics Two years' hospital work must have been accomplished *Final examination* medicine, surgery midwifery and diseases of women, mental diseases and ophthalmology Attendance at a general hospital for a year after the passing of the fourth examination is required also attendance at a fever, maternity, and mental hospital for three months each Courses of instruction must be taken in vaccination, ophthalmology, venereal and skin diseases, and diseases of ear, nose, and throat, medical and surgical anatomy, and operative surgery Distinctions may be awarded in the subjects (severally) of the second, third, fourth, and final, and first- and second class honours in the final examination

The *fees* for the full course for the M B degree amount to about £250

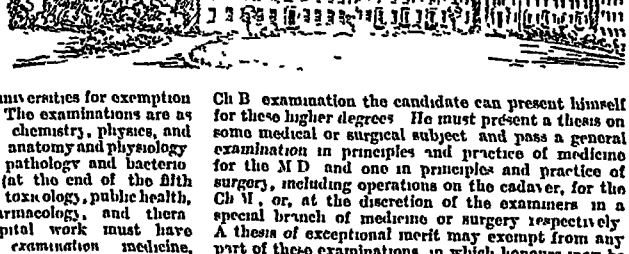
Entrance scholarships (*a*) Frank Fletcher and Catherine Fletcher scholarships of £100 per annum each, for five years Two or more offered annually (*b*) Sydenham scholarship of £42, tenable for three years, for orphan sons of medical practitioners (*c*) Sands Cox scholarship of £21 per annum for two years, awarded to the candidate taking the highest marks at the higher school certificate examination of the Joint Matriculation Board

Other scholarships—(*a*) Walter Myers travelling studentship of £300 awarded to M B candidates, tenable for one year at some university or hospital outside the British Isles (*b*) Fentham trustees and Hills post graduate scholarships, both of £130 per annum, for research in medicine or surgery

Students receive clinical instruction at the Birmingham United Hospital (General Hospital and Queen's Hospital), Maternity Hospital, Children's Hospital, Birmingham and Midland Eye Hospital, and at the Birmingham Mental and Fever Hospitals, under the direction of the Board of Clinical Studies At these hospitals appointments are open to recently qualified students at salaries of £40–£200 a year

Post graduate instruction.—Ingleby Lectureship (endowed) two post graduate lectures on a subject relating to midwifery and diseases of women and children are delivered annually (no fee) William Withering Lectureship (endowed), a course of three or four lectures is given annually on subjects chosen from year to year (no fee) Special post graduate courses are arranged from time to time at the Birmingham United Hospital (General and Queen's) and the Children's Hospital

Degrees of Doctor of Medicine and Master of Surgery One year after having passed the final M B,



Ch B examination the candidate can present himself for these higher degrees He must present a thesis on some medical or surgical subject and pass a general examination in principles and practice of medicine for the M D and one in principles and practice of surgery, including operations on the cadaver, for the Ch M, or, at the discretion of the examiners in a special branch of medicine or surgery respectively A thesis of exceptional merit may exempt from any part of these examinations, in which honours may be awarded

Degree of Ph D—Candidates must possess a medical degree of a British, Colonial, or other university approved by the Senate of the University, and have been engaged as a rule in advanced study for two years, either in a laboratory of the University or in

one or more of the hospitals associated with the University. But under approved conditions after the first year research may be carried on elsewhere, when, on completing the course, candidates present a thesis and submit themselves for oral and possibly written examination.

Birmingham United Hospital

The Birmingham General Hospital, the Queen's Hospital and the Queen Elizabeth Hospital, formerly known as the Hospitals Centre, have now been incorporated as one hospital by Act of Parliament Altogether the United Hospital has 1335 beds.

BIRMINGHAM GENERAL HOSPITAL has 485 beds A children's ward has been built, and there are special wards for gynæcological, ear and throat, venereal, and radium patients, with special beds for eye and skin patients. Laboratories are provided for bacteriology, biochemistry, cancer research, and morbid histology In addition to clinical teaching in the wards and out-patient department by the honorary medical staff, medical and surgical tutorial classes are held for senior and junior students. The radiation department is of special interest, the latest addition being a 3-gramme radium bomb The department also possesses deep X ray, Chaoul, and superficial apparatus Post-graduate classes are held in every branch of medicine and surgery

The *resident appointments* are surgical officer and medical officer, surgical registrars (3), anæsthetist, house physicians (4), and house surgeons (10)

QUEEN'S HOSPITAL has 336 beds Ward rounds and out-patient clinic classes are held daily, and regular tutorial classes throughout the session Post-graduate courses arranged by the University are conducted every year. There are special departments in gynæcology, diseases of the eye, of the ear, nose, and throat, dentistry, dermatology, radiology, pathology, bacteriology, biochemistry, physiotherapy' electrocardiography, and there is a psychiatric clinic associated officially with the Birmingham Mental Hospitals. There are also large wards for midwifery and postnatal cases, a nursery for instruction in infant welfare, an extensive midwifery district, and residential facilities for students. There are 35 *resident appointments* (inclusive of registrars) available each year for recently qualified students.

QUEEN ELIZABETH HOSPITAL at Edgbaston was opened in July of last year. It is close to the new medical faculty buildings of Birmingham University, to which it is linked by a corridor, and there is the closest coöperation between the hospital and the medical school, most members of the staff being common to both institutions. The hospital has 516 beds for medical and surgical, ear, nose, and throat, gynæcological and obstetric, ophthalmic, dental and skin cases, and out-patient consultations are arranged in the ward units There are five general and five specialist operating theatres, a spacious X ray department with a full range of apparatus for treatment and diagnosis, a supply of radium, a massage and electrical department, to which a hydrotherapy department will later be added, and special laboratories for bacteriology and biochemistry.

There are many *resident appointments*, including a resident medical officer, a resident surgical officer, medical and surgical registrars, and house physicians and house surgeons to the general and special departments.

UNIVERSITY OF LIVERPOOL

The teaching of medicine at the University dates back to 1789, but the first school was founded in 1834, and in 1844 this was taken over by the Liverpool Royal Infirmary school of medicine which continued until the establishment of University College, Liverpool, in 1881. The council of this school took a prominent part in the foundation of University College and in 1884, when University College became part of Victoria University, the school became the medical faculty of the college From that date the school developed rapidly so that in 1903, when University College was dissolved and the charter of the University of Liverpool was granted, there were 190 students. At the present time there

are 14 chairs and 657 students. Instruction is provided in well-equipped modern laboratories, most of them constituting a block of buildings which forms one side of the University quadrangle. The medical school for anatomy, surgery, forensic medicine, and toxicology; the Thompson-Yates laboratories for physiology and pathology, and the Johnston laboratories for biochemistry are included in the block, and there are separate buildings for medicine, pharmacology, bacteriology, tropical medicine, and public health.

Clinical instruction is given at (*a*) the Royal Liverpool United Hospital; (*b*) five special hospitals the Eye, Ear, and Throat Infirmary, the Women's Hospital, the Royal Liverpool Children's Hospital, the Liverpool Maternity Hospital, and St. Paul's Eye Hospital; (*c*) certain municipal hospitals: the County Mental Hospital, Ramhill, and the Seamen's Dispensary. All the hospitals are within easy reach of the University. They provide ample clinical material for students and a large number of resident appointments for qualified men

Admission—Students are required before beginning their courses to have passed the examination or examinations for matriculation into the University or an examination or examinations recognised as exempting therefrom Qualification for entry upon a degree course will normally be based upon the performance of the candidate in the school certificate and higher school certificate examinations conducted by the joint matriculation board or by other recognised examining bodies Full information will be found in a pamphlet, "Qualifications for entry upon a degree course," to be obtained from the registrar of Liverpool University or the secretary of the Joint Matriculation Board. Requests for papers set at previous examinations and application for exemption should be addressed to the secretary, Joint Matriculation Board, 315, Oxford-road, Manchester, 13.

Entrance scholarships—Tenable for four years: (*a*) Robert Gee entrance scholarship (men) of £42 10*s*., (*b*) Mary Birrell Davies memorial fund scholarship (women)

of £60 Tenable for three years (c) Bromley scholarship of £45, (d) Christopher Bushell scholarship of £40, (e) Henry Wade Deacon scholarship of £68, (f) Gossage scholarship of £60, (g) Cyril Edward Gourley scholarship of £30, (h) Henry Bloom Noble scholarship of £100, (i) John Patterson scholarship of £100; (j) Gibson Sinclair scholarship of £50, (k) Margaret Bryce Smith scholarships of £100 each, (l) Woolton Mechanics' Institution of £65 Some of these are restricted to candidates from specified areas

Where the value of an entrance scholarship is less than the tuition fees payable, it will, in most cases, be raised to that amount

Residence of students—There is no accommodation for residence within the University precincts, but halls of residence are provided for students who cannot live at home There are two halls for men in Greenbank, Mossley Hill, and one for women in Holly road, Fairfield The fees for board and residence for the three ordinary University terms are for men, £72, for women, £65–£72 All undergraduates not permanently resident in Great Britain are required to reside in approved lodgings, unless exempted by the Vice Chancellor The charges of these vary from 30*s* to 45*s* a week.

Qualifying examinations—Candidates for the degrees of bachelor of medicine and surgery must pursue the courses of study required by the University regulations during not less than six years Of these six years they must spend in the University at least three years altogether, or at least two after they have passed the first examination The other three may be spent at any recognised university or medical school The candidates must pass three examinations the first examination, taken in his first year in chemistry, biology, and physics, the second taken in his third year in anatomy and physiology (including biochemistry and histology), and the final, which is divided into three parts (1) pathology, pharmacology, and general therapeutics, (2) forensic medicine, toxicology, and public health, and (3) medicine, surgery, and obstetrics These parts may be taken separately, but candidates may not present themselves for part 3 until they have completed their sixth year of medical study and passed parts 1 and 2

Fees—The various courses may be taken separately, or certain groups of courses may be taken together at composition fees which are considerably less than the total of the fees for the separate courses The composition fee for students taking the full six years' course is £198 12*s* (payable in yearly instalments varying from £19 to £45), to which must be added the clinical studies fee of £60 (payable in three yearly instalments of £20 each) The examination fees are 20 guineas for the three examinations The approximate cost of the M B course (tuition, examination, guild of undergraduates fees, &c), together with an estimate of the cost of instruments and books is £382 3*s* 6*d*

Higher degrees—The University grants three higher medical degrees Doctor of Medicine (M D), Master of Surgery (Ch M), and Master of Orthopædic Surgery (M Ch Orth)

A candidate for the degree of M D, or Ch.M must have obtained the degree of M B (Liverpool) and at least two years must have elapsed since he passed the examinations for that degree

For the degree of M D the candidate must present a thesis; and, if this is accepted present himself for an oral examination on the subject of the thesis A candidate may also take the degree of M.D five years after taking his M B by passing an examination in medicine, together with a selected branch of medicine

A candidate for the degree of Ch M must furnish certificates of having satisfied the requirements for attendance and study for a period of at least two years subsequent to graduation The subjects of examination for the degree are surgery, clinical surgery, operative surgery, surgical pathology, and bacteriology, and surgical anatomy

The degree of M Ch Orth may be conferred, after examination, upon graduates in medicine of Liverpool or other approved Universities, and upon graduates in a faculty other than medicine of Liverpool or other university who are Fellows of the Royal College of Surgeons of England, Edinburgh, or Ireland, or of the American College of Surgeons

Royal Liverpool United Hospital

In January, 1938, the four voluntary general hospitals attached to the medical school of the University of Liverpool—viz, the Liverpool Royal Infirmary (366 beds), the David Lewis Northern Hospital (220 beds) the Royal Southern Hospital (232 beds), and the Liverpool Stanley Hospital (120 beds)—were amalgamated under the title of the Royal Liverpool United Hospital The aim of the amalgamation is eventually to create one large teaching hospital of a thousand beds, and in the meantime, to establish a closer working between the four hospitals

The *appointments* available for qualified students in the United Hospital are 8 house physicians 18 house surgeons, 4 casualty officers, 7 medical registrars, 7 surgical registrars, 2 gynæcological registrars, 3 orthopædic registrars, and 2 radiological registrars, together with a variable number of posts as clinical assistants Students are appointed as surgical dressers and clinical clerks for a period of three months and also as casualty dressers for one month The following special clinics are open to students asthma, cardiological, diabetic, ear, nose and throat, gynæcological, neurological, ophthalmic, orthopædic, psychiatrical, skin and venereal diseases

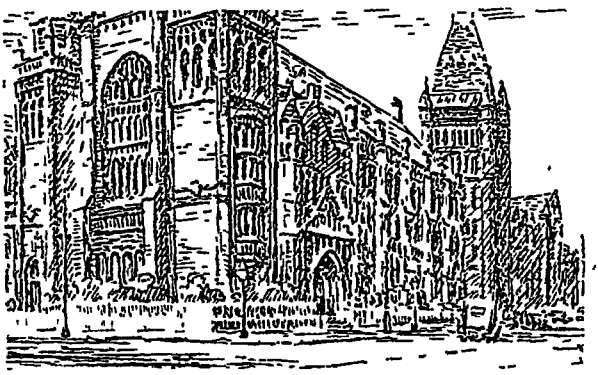
UNIVERSITY OF MANCHESTER

The school owed its beginning to the foundation of the Manchester Royal Infirmary in 1752, when apprentices were admitted to the small hospital In 1783 lectures were delivered in preliminary medical subjects, a small school of anatomy was begun in 1814 and an organised scheme of medical education in 1824 This was the first provincial school of medicine and was recognised as such by William IV in 1836 In 1872 the school was *amalgamated with* the Owens College, which was granted a charter as a university in 1880

At the present time, the school buildings as extended in 1920 are used mainly for the teaching of anatomy, histology, physiology, pharmacology, and practical pharmacy Each of these departments has its own lecture theatre, laboratories, and library In addition there are a large medical library and reading-room for students and common rooms for undergraduates The teaching of pathology and bacteriology is given in separate buildings close to the Royal Infirmary, which is the principal undergraduate teaching hospital for clinical work Instruction is also given at the St Mary's Hospitals for women and children (where students are accommodated for their two months' midwifery residence), the Royal Eye Hospital, and at the municipal fever hospitals and mental hospitals There is a hostel for final year students in close proximity to the Royal Infirmary, where residence for three months is compulsory

Admission to medical courses—A candidate must have satisfied the general requirements for entry to the University by gaining a school certificate, and in addition (*a*) a full higher school certificate, or

(*b*) four subjects at a subsidiary standard of the higher school certificate All information regarding these examinations should be obtained from the Joint Matriculation Board, 315, Oxford-road, Manchester. For entry to the faculty of medicine, the subjects of English, mathematics, mechanics or physics, and either Latin, Greek, French or German



must have been passed with credit in the school certificate or other recognised examination of the same or higher standard

About 70 per cent. of students live at home during their course The remainder are advised to live in one of the Halls of Residence, of which there are five for men (accommodating about 330) and four for women.

Entrance scholarships—(*a*) Dreschfeld scholarship (triennial) of £20 for two years, (*b*) John Russell scholarship of £45 for one year, (*c*) Sam Gamble medical scholarship for women; (*d*) two entrance scholarships in medicine covering fees up to 160 guineas for graduates in science and arts Scholarships are also awarded on the result of examinations held in May. Full particulars may be obtained from the registrar.

Other scholarships—Two Dauntesey medical junior, £50 each (on results of first examination), Dauntesey medical senior, £50 (on results of second examination), Professor Tom Jones exhibition in anatomy, £25, Dickenson Trust scholarships in anatomy and pathology; Platt physiological, £90, graduate research scholarship, £70, Dickenson Trust travelling scholarships in medicine and surgery, Ashby Memorial in diseases of children (triennial), £100, Holt post-graduate medical scholarship for Women, £60

Fellowships—Leech Research, £100; Professor Tom Jones surgical fellowship, £150, Morrison Watson in anatomy, £150, John Henry Agnew fellowship in diseases of children, £130; Delépine fellowship in preventive medicine, £300, Pilkington fellowship in cancer research, £300, Knight fellowship in psychological medicine (triennial), £150

Fees—Tuition fees are as follows. first year, £47 13*s*; second year, £32 18*s*.; third year, £93 18*s*; fourth year, £32 2*s*, fifth year, £91 9*s* (including residence in hostel £30). Examination fees for the M B degree amount to £42

The approximate cost of the whole course (6 years) including books, &c, is £365

The *cost of living* in a hostel is about £70–£80 a year; in lodgings from 30*s*. to £2 a week

Qualifying examinations—There are four examinations for the degrees of Bachelor of Medicine and Bachelor of Surgery (M B, Ch.B) First- and second-class honours may be awarded at the passing of the final examinations; distinction may be granted in any subject of the second, third, or final examinations The examinations are: (i) Part 1, chemistry (inorganic and organic) and physics; Part 2, (*a*) botany, (*b*) zoology. These parts are taken separately. (ii) Anatomy, with histology and physiology. (Must be passed at one and the same examination) (iii) (*a*) Pharmacology, (*b*) pathology and bacteriology. These are taken separately. (iv) (Final examination) Part 1, (*a*) forensic medicine, (*b*) hygiene and preventive medicine; Part 2, (*a*) medicine, (*b*) surgery, (*c*) obstetrics and gynæcology. The subjects of each part of the final examination must be passed at one and the same time It is essential to reach a pass standard in the clinical examination of each subject of Part 2

Doctor of Medicine—Candidates must have obtained the degree of M B at Manchester at least a year before admission They may either (*a*) present an original dissertation, or (*b*) undergo an examination in the principles and practice of medicine, pathology, and some other subject selected by the candidate

Master of Surgery—The conditions of admission are the same as for the degree of M D The degree is conferred in the following branches: surgery; gynæcology, ophthalmology, laryngology, otology, and rhinology

In addition the University grants the degrees of B Sc and M Sc. in the schools of anatomy and physiology, and awards diplomas in psychological medicine, public health, and bacteriology.

Clinical studies are carried out in the hospitals set out below, and at St Mary's Hospital for Women and Children, the Skin Hospital, the Eye Hospital, the Tuberculosis Clinic and Hospital, and the Babies' Hospital.

The Manchester Royal Infirmary is the oldest teaching hospital in the provinces, having admitted students to its wards from the eighteenth century onwards The present Institution is situated, to the great convenience of students, within five minutes' walk of the University, and adjoins other hospitals associated with the University. It has accommodation for 586 beds, of which 26 are allotted to the special and emergency departments, 230 to medical, and 330 to surgical practice Associated with the Infirmary are: (1) the Convalescent Hospital at Cheadle containing 136 beds and (2) the Central Branch in the City containing 54 beds

The medical side consists of four units, each with male and female wards, a test-room for routine chemical and microscopical investigations, and a class room The surgical side also has four units, each with its own operating theatre, with sterilising, anæsthetising, recovery, apparatus, and test rooms, and a class-room The aural, orthopædic, neuro surgical, and out-patient departments each have their own operating theatre Bacteriological investigations are carried out in a special clinical laboratory A department for the study of heart disease, with an electrocardiograph and other instruments for research, diagnosis, and teaching purposes is attached to the medical wards The X ray department has nine separate X ray outfits for different purposes and one large room is put aside specially for X ray demonstrations and teaching. There is a large modern physio therapeutic department and also a department of plastic surgery

Women students are admitted on the same terms as men Two *entrance scholarships* in medicine of the value of £160 each are offered annually by the Council of the University and the Medical Board of the Infirmary for proficiency in arts and science subjects respectively

The following *resident appointments* are made annually: resident medical officer, resident surgical officer, resident casualty officer, two resident clinical pathologists, senior and junior resident medical officers at the Convalescent Hospital, senior house surgeon for the central branch, surgical registrar to out-patients Four house physicians are appointed

every six months, and sixteen house surgeons to general surgical units every nine months House surgeons for the neuro-surgical and orthopædic departments are appointed every six months A house surgeon for the special departments is appointed every three months, and various non resident appointments, including eleven chief assistantships, are made annually

The Royal Manchester Children's Hospital was founded in 1829 in Ridgefield, Manchester, but the present hospital at Pendlebury was not opened until 1878 The Dispensary in Gartside street, Manchester, was opened in 1907, replacing an old building erected in 1868 Of the two convalescent homes, that at Lytham St Annes was presented to the Hospital in 1897, whilst the Zachary Merton Home at Pendlebury was completed and formally opened in March, 1936 The Hospital is recognised by the Royal College of Physicians for the Diploma of Child Health The total bed complement is 262 including an Isolation Block of 12 beds, the Seaside Home with 30 beds, and the Zachary Merton Home with 40 beds There are special departments for massage, artificial sunlight, electro therapy, and speech-therapy, and a separate ward and department devoted to the treatment of orthopædic cases

Resident medical officers at the Hospital, and non-resident clinical assistants at the Dispensary, are appointed for periods of six months

Ancoats Hospital, Manchester, is a general hospital of 151 beds and a Convalescent branch which is situated at Great Warford, Alderley Edge, Cheshire, and has 35 beds

The medical side consists of three units under the care of three honorary physicians with three out-patient clinics of a consultative nature A cardiographic department is under the care of one of the physicians Much work is done in gastro enterology, neurology, and diseases of the blood The surgical units are four in number, each under the care of an honorary surgeon, the orthopædic department, which deals with all fractures and bone injuries, is very large One surgical unit is devoted to abdominal surgery, and one to oto rhino laryngology, while a urological department is under the care of one of the honorary surgeons All these units have a largely attended out patient department Clinical teaching is given both to under graduate and post-graduate students in all the out patient clinics which are free to them, and in the wards, while post graduate lectures are given in the autumn and spring Clinical assistantships are available for post-graduates

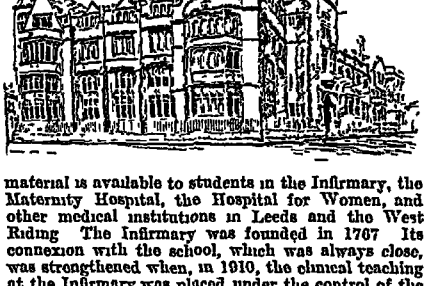
There are seven resident appointments which are open to men and women graduates, and twelve part-time registrar appointments (medical, surgical, orthopædic, and laryngological), which are renewable annually

UNIVERSITY OF LEEDS

The school of medicine began in 1831 in a few back rooms in the old Public Dispensary It proved a success from the first The need for larger accommodation, which has been an ever present problem, was soon evident, and the school was moved in 1834 to a house in Park parade and later, in 1865 to a new building in Park street, the first in this country to be erected expressly as a medical school In those days the medical student, who was most often the apprentice of a general practitioner, was brought at once into contact with clinical work The importance of preliminary scientific study was recognised however and in 1875 the student was required to attend classes in chemistry, biology, and comparative anatomy at the new Yorkshire College of Science These additions to the curriculum led to the incorporation in 1884 of the school with the college which, after forming part of the Federal Victoria University for seventeen years, was finally established in 1904 as the University of Leeds

The present school was built in 1894 It catered mainly for anatomy and physiology, leaving only a small space for pathology and none for bacteriology The subsequent enormous expansion of the two latter departments and the admission of women students made its further enlargement inevitable Extensive additions were made in 1930 and three years later a separate Institute of Pathology was opened accommodating the departments of pathology, bacteriology, and cancer research The new school of dentistry was opened in 1928 The number of medical students at the University is now 501, of whom 93 are women

The school is separated from the General Infirmary by the width of a street only, and a wealth of clinical



material is available to students in the Infirmary, the Maternity Hospital, the Hospital for Women, and other medical institutions in Leeds and the West Riding The Infirmary was founded in 1767 Its connexion with the school, which was always close, was strengthened when, in 1910, the clinical teaching at the Infirmary was placed under the control of the University and later when, with the help of the University, it provided an instructional block containing accommodation for clinical lectures and tutorial instruction as well as a clinical laboratory for the use of clerks and dressers Within the past few years over £250,000 has been raised for further expansion and extensive new buildings are now in course of erection

Clinical instruction in obstetrics is given at the Maternity Hospital, in gynæcology at the Women's Hospital, in mental diseases at the West Riding Mental Hospital, Wakefield, and in infectious diseases at the City Fever Hospital at Seacroft All other special departments are within the Leeds General Infirmary

Admission to the University is conditioned by the regulations of the Northern Universities' Joint Matriculation Board which now require a student to have obtained a school certificate and thereafter either a higher school certificate or a pass at one and the same higher school certificate examination in four subjects, at or above the subsidiary standard Students reading for external degrees and other registrable qualifications are accepted if accommodation is available At present such accommodation is very limited

Scholarships.—As compared with the older universities, the University of Leeds has few scholarship endowments Entrance scholarships are in the main confined to the

children of Yorkshire parents—e g , the Frank Parkinson and John Gilbert Vause Memorial scholarships. Many entrance scholarships are awarded by the various city and borough councils and county councils. A number of prizes and scholarships are awarded during the course of studies.

Tuition fees and cost of living—The approximate total cost of the medical course, not including the Joint Matriculation Board's examination fees, is £385, which includes registration fee, £2; composition fee (paid by annual instalments), £265; maternity hostel fee (3 months), £35 15*s.*; examination fees, £18; books, instruments, &c , £64; and convocation fee, £1.

The University has provided halls of residence for men and women students. The fees for men are £60–£68 per session of 32 weeks and for women £64–£67 according to the accommodation chosen On this basis the cost of living over the whole period of the medical course, exclusive of vacations, amounts to about £460 for men and £425 for women. About three-quarters of the students reside at home during the period of their medical training

Qualifying examinations—There are four examinations for the degree of M B The first includes physics, chemistry, botany, and zoology; the second, materia medica, anatomy, and physiology; the third, pathology, bacteriology, and pharmacology; and the fourth (Part 1), public health and forensic medicine, and (Part 2), medicine, surgery, and obstetrics Part 2 of the final examination is normally taken three months after Part 1 and may not be taken before the end of the third clinical year or before the completion of the fifth year of medical study proper.

Higher degrees—Admission to the degrees of *Doctor of Medicine* and *Master of Surgery* is limited to graduates of the University. A candidate for the degree of M.D. must have completed either (*a*) two years of approved hospital practice or approved special study or (*b*) four years in the practice of their profession in one or other of its branches. A candidate for the degree of Ch.M is not admitted until two years have elapsed from the date of his graduation as M B. In dental surgery the University grants two degrees, B.Ch D. and M Ch D., and a diploma, L D.S.

The General Infirmary

This hospital has accommodation for 673 beds, of which 438 are allotted to general medical and surgical cases, adults and children, the remainder being given up to ophthalmic, aural, orthopædic, radium, dermatological, and neuro-surgical cases. In that total is included the patients in the auxiliary branch hospital, the Ida and Robert Arthington, containing 101 beds. The University and hospital paid appointments in connexion with the infirmary and other bodies are numerous. Associated also with the infirmary is the Women's Hospital of 84 beds for the treatment of gynæcological and obstetric diseases; students when eligible attend the practice of this hospital, to which there are three paid resident appointments Recognised students may attend the clinical teaching in the out-patients' department of the Leeds Public Dispensary and Hospital During the autumn and spring terms, regular post-graduate lectures and demonstrations are held at the General Infirmary, and at the Public Dispensary and Hospital, which are open to all general practitioners resident in the district.

Leeds Maternity Hospital contains 140 beds for cases of labour, while there is other accommodation attached for the treatment of morbid pregnancies. There is an X ray department, and large extern districts are centred upon the institution The hospital is affiliated to the University for purposes of clinical training, and every student takes an obstetric clerkship and attends in the intern and extern departments During the second and third months personal contact with not less than 20 cases of labour is required, the students being resident in the neighbouring hostel.

West Riding Mental Hospital

The well-known hospital at Wakefield accommodates 2600 patients, a separate building, containing 400 beds, being provided for the treatment of acute insanity. Clinical clerkships in the wards and laboratories can be filled by qualified practitioners or, on application to the medical superintendent, by senior students This hospital is a recognised institution for the purpose of training for the diploma in psychological medicine Courses of lectures in mental diseases and laboratory work can be taken at the hospital, forming part of the University of Leeds course for the diploma.

UNIVERSITY OF SHEFFIELD

The earliest medical school in Sheffield, known as the "Church-street School" was founded in 1828, when the foundation-stone was laid of the building in Surrey-street in which the school of medicine carried on its work, with varying fortunes for 60 years. In 1888, as the result of an appeal to the public, a large building was erected in Leopold-street. In 1897 a Royal Charter of incorporation was granted to University College, Sheffield, the medical school being amalgamated for that purpose with Firth College and the Technical School. A University Charter, giving powers to confer degrees, was granted to the College in 1905, when the present University buildings in Western Bank were opened.

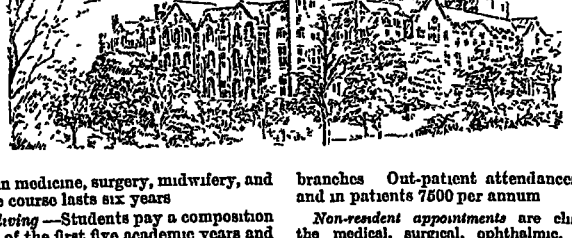
For the five years before the Great War the average number of students in the school was only about 40 and, after participating in the post-war increase, the school remained stationary for many years with 70–80 students; since 1932, however, the numbers have rapidly risen to the present 180. It is interesting to note that up till about 1930 at least half of the students were reading for the degrees or diplomas of other examining bodies, whereas now two-thirds are reading for Sheffield degrees. About fifteen years ago the medical curriculum in Sheffield was revised and the course increased to five and a half years The new curriculum abolished the artificial distinction between clinical and preclinical subjects and stressed the close inter-relationship and mutual dependence of the two groups of subjects. Twenty years ago a chair of pharmacology was established, the holder of which was appointed an honorary physician to one of the teaching hospitals with in-patient and out-patient facilities for teaching and research. At the moment new buildings are being erected so that all laboratory accommodation may be increased, and a new department of biochemistry has been established.

Admission—Students who intend to read for the Sheffield degree must fulfil the requirements of the Joint Matriculation Board. They will be qualified to enter the degree course if they hold (*a*) a school certificate and (*b*) either (1) a higher school certificate or (2) have passed at one and the same higher certificate examination in four subjects at or above the subsidiary standard. Students who have done chemistry and physics at school up to a standard approximately equivalent to that of the subsidiary higher certificate may enter on their first year work at the University in October, taking the pre-registration examination in March and the 1st M.B. in June. In the case of students who have done the whole of their chemistry and physics at school, and who

take the pre registration as external students, an additional subject such as English, history, or a language other than English will be required

Scholarships—(*a*) Four Town Trustees scholarships offered annually, each of £50 per annum for three years (*b*) Medical scholarship, offered annually, covers cost of tuition for a degree course (*c*) Six Edgar Allen scholarships offered annually, each of £100 per annum for three years

Qualifying examinations—Candidates for the degree of M B must pass the pre-registration examination in chemistry and physics, and thereafter the following four professional examinations first examination in biology, chemistry and physics, second examination in anatomy and physiology; third examination in pathology, bacteriology and pharmacology, applied anatomy and applied physiology, final examination in forensic medicine and public health and in medicine, surgery, midwifery, and therapeutics The course lasts six years



Fees and cost of living—Students pay a composition fee of £42 for each of the first five academic years and £28 for the sixth year

For a student living at home a total expenditure of about £380 will cover fees for tuition, examination, books, laboratory fees, and other incidental expenses Lodgings may be had from 25*s* to £3 3*s* per week, while residence in the fine new men's hostel, Crewe Hall, costs £66 per University session with an additional £2 per week during vacations The fees at the women's hostel are similar Approximately two-thirds of medical students are drawn from the immediate vicinity of Sheffield and live at home

Candidates for the degree of *Doctor of Medicine* must have passed the examination for the degree of M B at least two years previously and must subsequently have spent a year either in approved hospital practice or in scientific work at a university They must then either pass an examination in medicine, general pathology and experimental medicine and some special subject, or present a thesis

Candidates for the degree of *Master of Surgery* must have passed their M B at least three years previously and must subsequently have held surgical appointments at a hospital for at least a year They must then pass an examination in (*a*) general surgery and (*b*) a special branch of surgery

A vast amount of clinical material is available in the Sheffield medical school because it has been the policy of the school to give first consideration to maintaining a high standard of clinical teaching rather than to increasing unduly the number of students There are two general hospitals the Sheffield Royal Infirmary and the Sheffield Royal Hospital, these two institutions have recently been amalgamated and a new teaching hospital will, in the near future, result from the scheme for reorganisation at present being drawn up Special facilities are given for the teaching of orthopædics radiotherapy and dentistry The Jessop Hospital for Women caters for the teaching of midwifery and gynæcology and midwifery cases are available for students at the Municipal Hospital A separate Children's Hospital with 118 beds and the City Fever Hospitals (790 beds), the City Hospitals for Tuberculosis (510 beds), and the South Yorkshire Mental Hospital (2000 beds) are all available for teaching purposes

Sheffield Royal Infirmary

In January, 1939, the Royal Infirmary and the Royal Hospital were united in one corporation called the Royal Sheffield Infirmary and Hospital The present Infirmary has 500 beds and is fully equipped for the training of medical students and includes a training school for nurses and radiographers

New operating theatres were opened in May bringing the number of general theatres to six, the special departments have their own operating theatres The hospital serves a very wide area thus offering much clinical material in medicine and surgery in all its branches Out-patient attendances number 230,000 and in patients 7500 per annum

Non-resident appointments are clinical assistants to the medical, surgical, ophthalmic, aural, orthopædic, dermatological, and X ray departments

Resident appointments are resident surgical officer, three casualty officers, four house physicians, five house surgeons, and three house surgeons to the ophthalmic, aural, and orthopædic departments

There is a 3 months' course during the winter for post-graduate instruction There are also two post-graduate courses a year under the new Government scheme

Sheffield Royal Hospital

The hospital, which was founded in 1832, now has 300 beds, with a further 45 beds at the annexe and 48 at the Zachary Merton Convalescent Home, both situated at Fulwood A new seven floor block was opened last October containing the very latest X ray and radium equipment and wards laid out on modern lines There are 30 beds for paying patients and, in addition to the usual special departments, clinics for orthopædic and fracture cases, for diabetes, varicose veins, encephalitis lethargica, and for neuropsychological, gastro intestinal, and orthoptic treatment

There are 11 resident medical officers and 3 non resident dental officers Post graduate lectures are given regularly by the honorary staff, who are professors and lecturers at the University

Jessop Hospital for Women

The hospital has 151 beds, 51 for maternity, 77 for gynæcological, and 23 for puerperal sepsis cases The maternity beds include 15 reserved for antenatal patients Of the maternity admissions 25 per cent are emergency cases The puerperal sepsis cases are housed in a separate building, the Firth Auxiliary Hospital, to which is attached a bacteriological research department and a pregnancy diagnosis station There is, in addition a well equipped pathological laboratory in the hospital. About 1200 patients are delivered annually in the hospital,

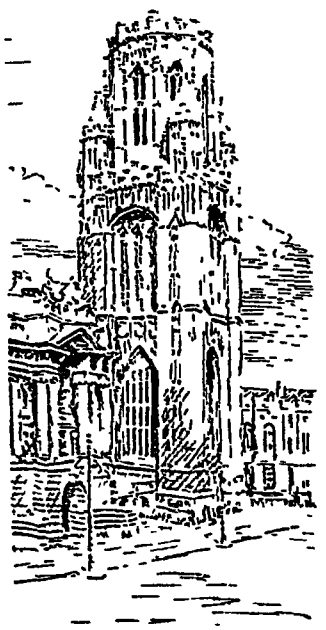
and some 200 on the district by hospital nurses in the City Domiciliary Service The gynæcological department deals with 1800 in-patients and over 2000 new out-patients in the year. Antenatal, post-natal, and venereal diseases clinics are held several times a week, and recently an infant follow-up clinic has been established under the care of a pædiatrician. The hospital is affiliated to the University for purposes of clinical training, each student being required to attend for a period of six months, and to reside in a neighbouring hostel for two months so that he may personally undertake the management of 20 cases of labour During each winter session there is a post-graduate course of clinical instruction.

The *resident staff* consists of a senior resident officer to the maternity department, four gynæcological house surgeons, and a house surgeon in charge of the antenatal and puerperal sepsis beds

UNIVERSITY OF BRISTOL

Lectures in medicine were given at isolated schools and by independent teachers in Bristol from about 1737. A very strong school was formed in 1837 by the combination of lecturers from various groups, and before long all its competitors had disappeared. For fifty years this school continued to provide a sound medical education for West of England men though it had no power to grant qualifications of its own and no endowments In the seventies, when funds were needed to rebuild the old school, the idea arose of joining with those who were anxious to found a college of literature and science The scheme flourished, and in 1879 the school took over the first buildings on the new University College estate Twelve years later the school became fully incorporated with the College and Dr. Edward Fawcett was appointed the first professor of anatomy, and in 1909 it was merged in the newly created University, which now could grant medical degrees.

Admission.—Apart from a limited number of candidates for medical degrees of the Universities of Oxford and Cambridge, who wish to take only the clinical part of their course in Bristol, no students are at present being admitted to the faculty of medicine unless they are reading for the medical or dental degrees of the University or for the University's diploma in dental surgery. To be eligible for matriculation students must be at least 17 years of age and have passed a recognised school certificate examination with credit in five subjects or some other examination which is regarded by Senate as equivalent thereto. Credit standard is required in mathematics, a foreign language, and either English as a full subject or English language together with history.



Application for admission may be made either to the dean of the faculty or to the registrar at the University buildings Early application is advised.

Entrance scholarships.—(*a*) Two Dulverton open scholarships of £100 per annum for three years (*b*) Miriam Badock scholarship of £120 per annum for three years, and Henry Herbert Wills science scholarships, confined to students from Clifton College (*c*) Harold Greenwood memorial scholarship of £20 per annum for those who received instruction at a State-provided school in Clevedon or elsewhere in Somerset, and subsequently at a secondary school in Somerset or Bristol. (*d*) Skillicorne memorial scholarship of £35 per annum, awarded to a pupil of Cheltenham Grammar School. (*e*) Bristol city senior scholarships and those offered by the counties of Gloucestershire, Somerset, Wilts, and Dorset and the city of Bath are also tenable in the University.

Post-graduate scholarship and fellowship.—(*a*) Michael Hiatt Baker scholarship of £200 per annum for two years, renewable for a third year, tenable by a graduate from New Zealand. (*b*) University graduate scholarships, for graduates of not more than one year's standing, awarded for one session, but renewable for a second session (*c*) Ashworth Hallett scholarship of about £40, open to women only. (*d*) Beaverbrook fellowship (being the interest on £1000), intended primarily for research in clinical subjects; tenable by any member of the University holding a medical qualification, awarded for one year, but renewable for not more than three years. (*e*) Colston medical research fellowships, of not less than £100 per annum, primarily for clinical subjects, awarded by the Council of the Colston Research Society, and renewable yearly.

Qualifying examinations.—Candidates for the degrees of M.B., Ch B. must pass three examinations A higher school certificate in physics, chemistry, and biology will exempt a candidate from the first M B course and examination, provided he has reached a sufficient standard in organic chemistry and has studied to a standard beyond that of the first school certificate examination at least one of the following subjects, viz: English, history, geography, Latin, Greek, French, German, any other approved language, mathematics.

The *first examination* completes the first year's work—i e, physics, chemistry, and biology—and successful candidates are thereafter registered with the General Medical Council The examination in inorganic and physical chemistry and the examination in physics, organic chemistry, and biology are regarded as parts of the same examination, which must be passed as a whole, save that a candidate who has failed in one subject only may be allowed to offer himself for re-examination in that subject alone

The *second examination* is taken at the end of the third year of study The subjects of the examinations are:—Group I. anatomy and physiology, and Group II: elementary pharmacology and elementary pathology The examination must be taken and passed as a whole except that the candidate who has passed in Group I only may be allowed to offer himself for re-examination in Group II only.

The *final examination* is divided into two sections, which may be taken together but are usually taken separately. Section I includes materia medica and pharmacy, pharmacology, pharmacotherapeutics and toxicology, pathology, and bacteriology, and may be taken 2½ years after the second examination has been passed. The candidate must pass in all the subjects of Section I at the same time Section II

is divided into two groups, both of which must be passed within a period of 19 months A candidate who takes the whole of Section II at the same time and fails in one subject only may be allowed to present himself for re examination in that subject alone Section II may not be taken until the candidate has pursued the curriculum for five years after passing the first examination The subjects of this section are — Group I surgery, including ophthalmology and oto-rhino laryngology, and obstetrics, Group II medicine, including mental diseases, public health, and forensic medicine.

Fees and cost of living—Fees are normally paid by annual instalments, the fees for matriculation, registration, lectures and laboratory work, hospital practice, clinical instruction and appointments, dispensing, museum, fever hospital, psychiatry demonstrations, and vaccination, together with the annual subscription to the University of Bristol Union, examination fees, and the fee for admission to the degrees of M B, Ch B and for registration as a member of Convocation and Parliamentary voter, amount to £279 The cost of books and laboratory apparatus may be estimated roughly at £65 or £70

During the past few years 50–75 per cent of students have graduated from their homes Others must reside in a University Hall of Residence, unless required or permitted by the Vice Chancellor to live in registered lodgings The Halls of Residence for men are Mortimer House and Wills Hall, and for women Clifton Hill House and Manor Hall The inclusive fees for board and residence are £75–£89 per session for men and from £66 per session for women

Medical students must, at least in the last three years of the course, reside in Bristol during the vacations

Higher degrees—The University also grants the degree of *Master of Surgery*, which may be taken in either surgery, ophthalmology, oto rhino laryngology, or gynæcology, and *Doctor of Medicine*, which may be taken either by dissertation or by examination in general medicine or in State medicine These are open to medical graduates of the University two years after graduation

The degree of *Doctor of Philosophy*, for which two years' full time research is required, may be taken in the faculty of medicine

The degree of *Master of Dental Surgery* (*M D S*) is open to Bachelors of Dental Surgery of the University of two years' standing

Associated hospitals—Clinical instruction is given at Royal Infirmary and General Hospital, shortly to be amalgamated, Royal Hospital for Sick Children and Women, Eye Hospital, Fever Hospital at Ham Green, City and County Mental Hospital, Southmead Hospital, Stoke Park Colony for mental defectives, Winford Orthopædic Hospital, Winsley Sanatorium

Bristol General Hospital

The hospital was founded in 1832 with 20 beds and dealt with 192 in patients and 2532 out-patients in that year It now has 269 beds and deals with over 6000 in patients and over 40,000 out patients annually The hospital is in process of amalgamation with the Bristol Royal Infirmary and recently a new joint department was opened to do all the radiological work of the two institutions This department is equipped with the latest apparatus for high voltage therapy, superficial therapy and contact therapy and also houses the National Radium Centre In addition there are also special departments for skin diseases, affections of the ear, nose, throat, and eyes, electro cardiography, light treatment and physiotherapy

There are 9 resident medical officers and 1 non-resident dental officer Students attend for their clinical work at the hospital and are attached to members of the honorary staff who are professors and lecturers in the University

Bristol Royal Hospital for Sick Children and Women

Founded in 1857, this was the second children's hospital to be established in England Situated on a commanding site within a stone's throw of the University, the hospital serves a wide area and has over 100 children's beds Instruction in diseases of children is given by the staff in the wards and out-patient department Clinical clerkships are held in rotation by all medical students during their fifth and sixth years After qualifying, they are eligible for the posts of house physician or house surgeon which are tenable for six months, the appointments being made in April and September The hospital fulfils the requirements for the diploma in child health of the Conjoint Board

Bristol Royal Infirmary

Founded in 1736, this was the first voluntary hospital in the country, outside London, to receive in patients It was officially opened on Dec 13, 1737, and so celebrated its bicentenary in 1937 The original buildings proved quite inadequate after a few years to accommodate all the patients requiring admission. They were pulled down and new ones erected of which the central wing was completed in 1792 They have since been largely extended and now contain accommodation for 436 patients More than 10,500 in patients and 68,000 out-patients are dealt with each year The maternity work undertaken by the institution represents approximately one in five of the total births in Bristol, and correspondingly large antenatal and postnatal departments are maintained In the massage department nearly 100,000 treatments were given during the year

An amalgamation is being arranged between the Royal Infirmary and the Bristol General Hospital and the medical staffs are already considered as one The fracture departments of the two hospitals have been combined at the Royal Infirmary and the radiological departments at the General Hospital The geographical peculiarities of Bristol, which is divided into two parts by an inadequately bridged river, makes it difficult to erect a single "hospital centre" that would serve the whole city satisfactorily When the amalgamation has been completed it is suggested that all medical and surgical cases should be admitted to the Infirmary and all the special departments should be at the General Hospital The two will be known as the Bristol Royal Hospitals.

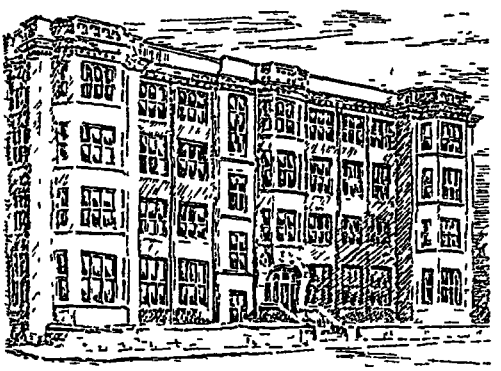
UNIVERSITY OF WALES

THE WELSH NATIONAL SCHOOL OF MEDICINE

This, the youngest of the schools of medicine, has had an interesting career and its fortunes are bound up with those of the federal University of Wales The University College, Cardiff was opened in 1883 and became a constituent institution of the University of Wales when the latter was established in 1893 From the first the College had departments of chemistry, physics, and biology in which medical students were trained From 1892 zoology and botany were separate departments and in 1894 departments of anatomy, physiology, and materia medica were started

In 1916 a Royal Commission on university education in Wales was appointed under the chairmanship of Lord Haldane It drew much of its inspiration on medical education from Sir William Osler, one of its members. The commission recommended a complete National school of medicine on the "unit system"—clinical units headed by full-time professors. The war delayed matters The complete school was started in 1921 with units in medicine and surgery and with the Cardiff Royal Infirmary as its principal clinical institution.

At first the school was a part of the Cardiff College but difficulties arose as regards its government and its position in the federal University scheme Eventually, in 1931, these were resolved by the retention of the departments of anatomy and physiology in the Cardiff



College under a joint academic committee of college and school and the formation of a separate institution, "The Welsh National School of Medicine," for clinical teaching In spite of the difficulties of its inception, the school has grown and prospered. At present there are over 300 medical students of all years of whom about 170 are in the clinical school.

Associated with the students' union society of Cardiff College is a medical students' club to which all students must belong. Student amenities have recently been supplemented by a refectory and residence which were much needed Other hostel accommodation is available Aided by a National Fitness Council grant a squash-rackets court has been erected near the residence

Admission.—Students enter the school by obtaining matriculation, or its equivalent, in the University of Wales Two of the following five subjects (of which one must be either physics or chemistry) must be included in the matriculation certificate: physics, chemistry, botany, zoology, biology. Subject to this condition of admission, students may be admitted who are preparing for examinations of licensing bodies other than the University of Wales.

Entrance scholarships and free studentships are available and there are numerous prizes and medals awarded during the student's course *There are also post-graduate research* scholarships in medicine and medical pathology, in cancer, in tuberculosis, and in obstetrics and gynæcology.

Qualifying examinations.—After three years' study and passing anatomy and physiology at a high standard, Welsh degree students obtain the degree of B.Sc, and then proceed to their clinical studies for the M.B, B.Ch. Candidates are required to pursue a course of study of not less than six academic years after their matriculation They must hold an arts or science degree of the University of Wales or of some other university approved for the purpose, but certain of the courses pursued for a B Sc or B A. degree may be counted as required for the medical degrees.

Fees.—The total tuition and examination fees for the whole of the six years amount to just under £300. The cost of living during this period may be roughly estimated at £100 a year. A certain number of students live at home

Higher degrees.—Candidates for the degree of *Doctor in Medicine* must pass an examination in clinical medicine and submit a thesis embodying the results of original observation or research A candidate must have obtained the degree of M.B in the University at least two years before submitting the thesis

The requirements for the degree of *Master of Surgery* are similar to the above, but the candidate must pass an examination in surgical anatomy, bacteriology, and surgical pathology, surgery, clinical surgery, and operative surgery.

Clinical instruction is given at a number of institutions, including Cardiff Royal Infirmary, Llandough Hospital (345 beds), a modern municipal hospital, the Prince of Wales' (Orthopædic) Hospital (138 beds), the Lord Pontypridd Children's Hospital (Rheumatism, 25 beds), and the various Tuberculosis Hospitals (608 beds). There are large and well-equipped mental and fever hospitals and full hospital provision for obstetric training.

Cardiff Royal Infirmary

The hospital has over 400 beds and large modernisations and additions to its buildings, which are to result from its Centenary Appeal, will add to its accommodation In 1938 the Infirmary admitted 6447 patients and treated 41,896 out-patients.

All inquiries and communications should be addressed to the secretary, The Welsh National School of Medicine, The Parade, Cardiff.

THE CARNEGIE TRUST

The Trust makes grants towards the class fees of approved students in the various Scottish Universities In the faculties of medicine the annual allowances are £20 a year for four years. Applicants must be over 16 and must be of Scottish birth or extraction or have attended a school or institution under the inspection of the Scottish Education Department for at least two years after reaching the age of 14 The parents or guardians of applicants are required to make a confidential statement of their financial circumstances Particulars from the Trust Offices, 22, Hanover-street, Edinburgh.

" . Examinations are works of necessity but not of mercy. Like all necessary things, they are apt to be tyrannical, tyrannising over both students and teachers, and often robbing the student of the best fruits of learning But while all admit the defects of examinations, no one has invented anything that will take their place And after all no student of mettle really wishes to escape the ordeal of examination · it is an honourable trial of his knowledge, it is also a test of moral qualities—courage and quickness, steadiness and suppleness of mind—qualities that will serve you well in your future practice Examinations are a searching test of the teacher also, and of his methods and success in teaching, experience in examinations is an important part of the education of a teacher. But the chief fault and danger in medical teaching, where subjects of great scope and complexity are dealt with in a short time, is that of giving more food than can be digested The golden rule in teaching is Attend to the understanding, and the memory will take care of itself"—Prof CHAS. MCNEIL in his promotor's address at Edinburgh Medical Graduation, July 19, 1939

MEDICAL SCHOOLS OF SCOTLAND

A STUDENT who wishes to enter upon a course of study to qualify for graduation in any faculty of a Scottish university must first obtain a certificate of fitness from the Scottish Universities Entrance Board A certificate is granted either on the result of the Board's preliminary examination or on evidence of having passed certain examinations elsewhere The preliminary examination is held at the four university seats twice a year, and four subjects must be taken, of which one must be English, one mathematics or physical science or dynamics, and one a foreign language Exemption from the examination is granted to holders of a degree at a recognised British or foreign university, a group leaving certificate of the Scottish Education Department containing passes in certain prescribed subjects, certain other certificates, or, in the case of a candidate educated in England, such qualifications as would admit him to the faculty of arts or science in an English university A similar rule applies to candidates from Wales, Ireland, and other countries Forms of application for a certificate may be obtained from the secretary of the Board, 31, North street, St Andrews, or from the secretaries of the universities

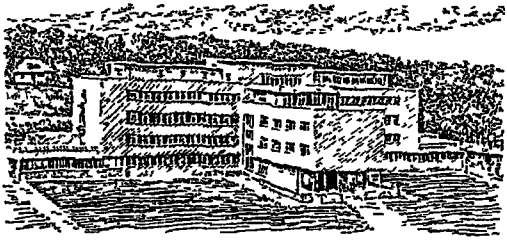
UNIVERSITY OF ABERDEEN

The University of Aberdeen was founded in 1494, and the chair of medicine represents the oldest foundation for the teaching of medicine in Great Britain The faculty of medicine embraces eleven chairs and numerous lectureships in the various branches of medical science, the most recent additions being lectureships in psycho-pathology and anthropology Now buildings to house the departments of surgery, medicine, midwifery, materia medica, pathology, bacteriology, public health, forensic medicine, and clinical chemistry have been erected and equipped on a site adjacent to the joint hospitals at Forester hill *It is intended to transfer the departments of* anatomy and physiology to the medical buildings at Foresterhill, and plans for the necessary extensions are in course of preparation There are now collected on this site the *Aberdeen Royal Infirmary*, the Royal Hospital for Sick Children, the Maternity Hospital, and the Royal Mental Hospital The town council is about to erect an antenatal annex to the Maternity Hospital The number of *medical students is now* 475 (370 men, 105 women)

Board and lodgings are plentiful at an average of 30s a week, and plans have been approved for the building of a hostel for final year students adjacent to the new medical buildings at Foresterhill The building will be completed in the course of the year A greatly enlarged students' union near Marischal College has now been completed Ample accommodation is available for athletics and a swimming pool for students is in course of construction The University buildings also contain a fully equipped gymnasium under the direction of two instructors

Bursaries ranging in value from £10 to £45 per annum, are available to students in the faculty of medicine, most of them tenable for 3–5 years Several fellowships and scholarships are awarded for post graduate study or research of the annual value of £200 and upwards In addition students who are eligible may apply for assistance from the Carnegie Fund (see opposite)

The course of study for the degrees of M B, Ch B covers a period of not less than five years and two terms The following four examinations must be passed—first biology, physics, and chemistry, second anatomy and physiology, third materia medica, pathology, forensic medicine, and public health and infectious diseases, fourth surgery, medicine, and midwifery



The total *fees* payable throughout the course of study, including class, matriculation, degree, and hospital fees, amount to approximately £250.

Clinical instruction is given at the following hospitals Aberdeen Royal Infirmary, Aberdeen Royal Hospital for Sick Children, Aberdeen Maternity Hospital, including antenatal department, Aberdeen Royal Mental Hospital, Aberdeen Dispensary and Vaccine Institute, Aberdeen Ophthalmic Institute, Aberdeen City Hospital for Infectious Diseases, and Woodend Hospital

For the degrees of *Doctor of Medicine* and *Master of Surgery*, candidates must hold the degrees of M B, Ch B of Aberdeen, present a thesis and pass a clinical examination in a special department of medical or surgical science *Candidates for the Ch M* are also examined in surgical anatomy, &c

A candidate for the degree of *Doctor of Philosophy* must previously have obtained a degree at Aberdeen University, or any other university specially recognised for the purpose, and must undertake special study or research for a period of not less than 9 academical terms He must submit a thesis containing a record of his work, and if required, must pass an oral or other examination

Aberdeen Royal Infirmary

The Infirmary, founded 200 years ago, is now housed in completely new buildings specially adapted for teaching purposes at Foresterhill The *University* medical school is immediately adjacent on the same site. There are 500 beds, with separate wards devoted to orthopædic surgery and genito urinary diseases and diseases of metabolism *There is also* a department of psychological medicine Regular courses of clinical instruction are arranged for undergraduates and there is a course for post graduates in the summer session Eighteen resident appointments are awarded to recently qualified men for periods of one year, and registrars are appointed from time to time as vacancies occur

Aberdeen Royal Mental Hospital

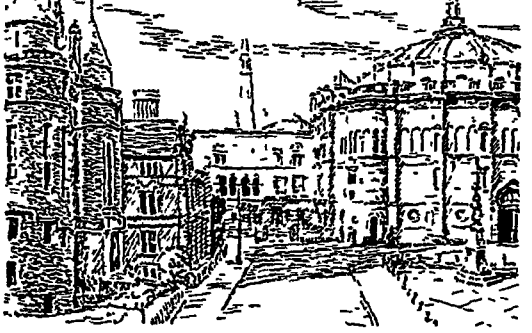
The hospital contains about 900 beds The class of mental diseases at the University of Aberdeen receives clinical instruction at the hospital. There are four resident assistant physicians and at least one undergraduate clinical assistant

UNIVERSITY OF EDINBURGH

The faculty of medicine was established in 1726 and in its formation the town council and the Royal Colleges of Physicians and Surgeons coöperated with the University. By 1869 the number of students and professors had increased to such an extent that an appeal for funds was made and the present buildings, which contain the majority of the medical class-rooms, were erected between 1878 and 1880. Since then several additions have been made to the buildings and many of the departments have been reconstructed to meet modern teaching requirements An ambitious scheme is now under consideration for extending the medical school buildings The number of students enrolled in the medical faculty in 1938–39 was 1298 (1079 men and 219 women). This includes those studying for higher degrees and diplomas, and occasional students Between 600 and 700 undergraduates are in the clinical years.

Considerable extension of the Royal Infirmary has also taken place during the last few years and a new maternity and gynæcological block, providing greatly improved facilities for teaching in midwifery and gynæcology, has been completed In addition extensions of the hospitals controlled by the municipality are well under way and altogether future students of medicine in Edinburgh are likely to have facilities for study far in advance of anything available to past generations of graduates

Admission —Prospective students are required to submit an application for admission on a prescribed form to the dean of the faculty of medicine. The entrance requirements include a preliminary or other examination recognised by the Scottish Universities Entrance Board and a pre-registration examination in physics and chemistry. The preliminary examination of the Scottish Universities Entrance Board consists of four subjects. English (including literature and history) is compulsory and either mathematics or



physical science must be taken, as well as a language—French, German, Latin, Greek, Italian, Spanish, &c.

Entrance bursaries —A large number of bursaries are awarded annually by the University and by outside patrons The University bursaries, and some others, are awarded on the result of the bursary examinations in general education held annually in May. A pamphlet giving full particulars may be obtained free from the matriculation office

The *qualifying examinations* are four and are held during or at the end of each of the five years of study. The first is taken in two parts, chemistry and zoology being held at the end of the first winter session in March and physics and botany at the end of the first summer session in July. The second examination, consisting of anatomy and physiology, is taken at the end of the second year in July. At the end of the third year the third examination takes place in pathology, bacteriology, materia medica, and therapeutics

The final professional examination is divided into two parts, the first part, in forensic medicine and public health, being taken at the end of the fourth year and the remainder of the subjects, midwifery, surgery, and medicine, at the end of the fifth and final year.

A feature of the Edinburgh curriculum is the arrangement of the work of the third year, which consists of coordinated courses in pathology, bacteriology, materia medica, therapeutics, medicine, and surgery extending over three terms. The sequence of study in the course of systematic medicine forms the basis of coördination In the fourth and fifth years students are required to spend a period of six months in attendance at one or other of the dispensaries in the city and during this period they have the opportunity of visiting the sick poor in their own homes. This type of training is most valuable and is a unique feature of the Edinburgh curriculum. In the course of midwifery also the students must spend a period of eight weeks in a hostel close to the Maternity Hospital for the purpose of following the practice of the hospital both during the day and night.

For some time past a scheme has been in existence under which a limited number of students can reside in the municipal general hospitals for periods of three months at a time. This has been most successful and it is intended to develop the arrangement as far as possible with a view to giving every student the opportunity of having at least three months in residence during his undergraduate training.

Fees and cost of living.—The total cost of the medical course is approximately £268, exclusive of the cost of books and instruments which may be estimated at £10–£20 per annum. The cost of board and lodging either in a private house or in a hostel is from £1 15*s.* to £2 5*s* per week.

Higher degrees.—Bachelors of Medicine and Bachelors of Surgery of not less than 24 years of age may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the military or naval medical services, or in scientific work bearing directly on their profession, or two years in practice In each case an examination must be passed and a thesis submitted for approval.

The main part of the hospital training of students is carried out in the Royal Infirmary, but for teaching in certain special subjects—e g., children's diseases, infectious diseases, tuberculosis, and psychiatry—the undergraduates attend the Royal Hospital for Sick Children, the City Fever Hospital, the Royal Victoria Hospital and Dispensary for Tuberculosis, and the Royal Edinburgh Hospital for Mental Disorders. The Municipal Hospitals are also utilised for training.

Edinburgh Royal Infirmary

The clinical instruction at Edinburgh University is carried on mainly at this institution. There are 1135 beds, including 71 cots for children Courses of clinical medicine and surgery are given by the physicians and surgeons to male and female students Special instruction is given on diseases of women, of the skin, of the eye, ear, nose, and throat, and the teeth. Separate wards are devoted to venereal diseases, diseases of women, diseases of the eye, the ear, throat, and nose, the skin, orthopædics, surgical neurology, and also to cases of incidental delirium or insanity There is also a large and complete radiological department in which is given theoretical and practical instruction for the University Diploma

in Medical Radiology, &c In addition to the out-patient departments connected with the surgical and medical houses, there are separate out patient rooms attached to the special departments Post mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in pathological anatomy and histology

During the past year a unit comprising 20 beds, out-patient consulting rooms, &c, for neurological cases requiring surgical treatment has been opened The operating room is of novel design with equipment for air sterilisation, lighting by means of a reflector, vaulted ceiling and a gallery for spectators Associated with the Infirmary is a convalescent home of 80 beds and an auxiliary institution of 30 beds for radium treatment

The *appointments* are 1 Resident physicians and surgeons are appointed and live in the house free of charge The appointment is for six months, but may be renewed at the end of that period by special recommendation 2 Non resident house physicians and surgeons and clinical assistants are appointed for six months The appointment may be renewed for a like period by special recommendation 3 Clerks and dressers are appointed by the physicians and surgeons These appointments are open to all students and junior practitioners holding hospital tickets 4 Assistants in the pathological department

At the **Simpson Memorial Maternity Pavilion**, a new branch of the Royal Infirmary containing 136 beds, clinical instruction is given by the Professor of midwifery and other obstetricians who are members of the teaching staff of the Royal Infirmary In addition, clinics and demonstrations are given to students in the delivery, puerperal and antenatal wards and also in the antenatal and postnatal out-patient departments Before the university students can qualify for a certificate on the subject they must reside for a period of at least eight weeks in the hostel close to the hospital so that they can take full advantage of the practical instruction on the emergency work Accommodation is available for post-graduates

Royal Hospital for Sick Children

This hospital, which is situated within easy distance of the University and the Royal Infirmary, contains about 130 cots, of which 50 are reserved for surgical cases and 12 for ear and throat cases It is fitted with every modern improvement and has a fully equipped out patient department for both medical and surgical cases Clinical instruction is given in the hospital by the professor of child life and health and the university lecturers in diseases of children The course which includes lectures and clinical teaching covers the care and management of the child in health as well as the medical and surgical aspects of disease in children

There are five resident officers (medical and surgical) who are appointed for a period of six months.

Royal Hospital for Mental Disorders

The 850 beds in this hospital are available for the clinical instruction of members of the university class of psychiatry and also for post graduate instruction Clinical lectures on the chief forms of mental disease and defect are given in the hospital and at the Jordanburn Nerve Hospital and the Gogarburn Certified Institution at Corstorphine A mental out patient clinic is also conducted at the Royal Infirmary and students have the opportunity of coming into personal contact with and examining cases During the past year a child-guidance clinic has been instituted There are resident physicianships and unqualified clinical clerkships in the hospital and a well equipped laboratory under a bacteriologist is available for the prosecution of clinical research by those holding these appointments

Edinburgh City Hospital

This is a large isolation hospital of modern construction, opened in 1903 Approximately 600 beds are normally available for all forms of acute infectious disease, and 200 for cases of surgical and advanced pulmonary tuberculosis The hospital has a close association with the University and the extra-mural school for the purposes of both undergraduate and post-graduate instruction, the medical superintendent being University lecturer in infectious diseases Clinics are also held from time to time in the tuberculosis wards by the University and extra-mural teachers Complete equipment exists for the investigation and treatment of all forms of infectious disease Three undergraduate courses and one post graduate course for D.P H candidates are given every year, whilst special post-graduate courses are arranged in conjunction with the Post-Graduate Association In the various courses clinical instruction is largely carried out at the bedside and special attention is directed to methods of individual immunisation and prophylaxis, and to the correlation of bacteriological and immunological findings with clinical and other manifestations of infectious disease Students attend the course in their fourth year after having passed the third professional, and attended courses in clinical medicine and surgery Three six-monthly resident appointments on an H P basis are available every half year on the fever side, and two similar posts in the tuberculosis wards

Royal Maternity Hospital

The hospital is situated close to the Royal Infirmary and the University medical school Here midwifery is studied clinically, instruction being given by the professor of midwifery and the other physicians and assistant physicians who are university lecturers on clinical obstetrics In addition to clinics and demonstrations members of the class are expected to follow all the work of the hospital, including the antenatal department Before he can qualify for a certificate in the subject each student must reside for a period of at least eight weeks in a University Hostel close to the hospital so that he can obtain full advantage of practical instruction on abnormal cases

UNIVERSITY OF GLASGOW

The medical school first began to represent an important part of the University work during the second half of the 18th century Towards the end of that period there were 200 students in the school and clinical teaching received a considerable impetus by the opening of the Royal Infirmary, not far from the old College, in 1794 For many years that institution, dealing with sufferers from the most varied ailments, including the infectious fevers was an invaluable training ground for hundreds of students After the transfer of the University to its present site in 1870 the greater part of the ordinary clinical instruction of University students was carried on at the Western Infirmary, newly erected in the vicinity, while special hospitals came more and more into existence, and so

available for special forms of instruction. Since 1911 the resources of the Royal Infirmary have been again increasingly drawn upon in view of the increased numbers requiring clinical training.

The teaching of the preliminary sciences has long received special attention in Glasgow. The Pathological Institute at the Western Infirmary, directed by the professor of pathology, was one of the first of its kind in this country. Since the beginning of the present century the facilities for scientific teaching have been greatly extended by the provision of large departments for botany, zoology, natural philosophy, anatomy, physiology, public health and materia medica An Institute of Medicine has recently been founded, equipped with laboratory

facilities, which will cater not only for elementary instruction but also for higher studies and research A new Institute of Chemistry will be opened this year. The number of students at present in the medical school is 1316 (1116 men and 200 women), of these 295 men and 43 women are entered for the combined course of science and medicine.

Admission—Applicants for entry must have passed the preliminary examination of the Scottish Universities Entrance Board as for arts or pure science, or its equivalent, and must be in possession of the "certificate of fitness" issued by that Board. The course, which extends over six years, starts in October and applications for admission must be received before the middle of June in any year. In recent years a limit has had to be set to the numbers admitted

Bursaries—There are a large number of entrance bursaries awarded by competition annually in connexion with the University, and about 25 of these may be held by students of medicine There are also several bursaries awarded during the course on the results of the professional examinations. Several research scholarships and fellowships are available also for graduates.

Qualifying examinations—There are four Professional Examinations for the degree of M.B., Ch B. For students admitted in 1939 and onwards these will be arranged as follows—First: botany, zoology, chemistry and physics. Completed at end of first year. Second: anatomy and physiology, at end of seventh term Third: materia medica at end of third year, and pathology at end of fourth year. Fourth: Part I, medical jurisprudence and public health, at end of fifth year, Part II, medicine, surgery and midwifery, at end of sixth year. There is also a combined science and medicine course with anatomy and physiology as final subjects for the degree of B Sc

Fees and cost of living—The fees for tuition, including clinical work and examinations, amount to about £275. Hostels are available for a limited number of men students at £17 10*s* per term, and for women students at 32*s*–37*s*. 6*d* per week Lodgings in Glasgow at present cost 30*s*–35*s*. per week. About three-quarters of the students live at home.

The degrees of *Doctor of Medicine* and *Master of Surgery* are granted to candidates who have previously obtained the double bachelorship, on submitting an approved thesis and completing examinations in clinical medicine for M.D., and in surgical anatomy, operations on the dead body, and clinical surgery for Ch M. The degree of *Doctor of Philosophy* is also conferred in the faculty of medicine. Candidates must already have obtained a degree (or equivalent diploma) from an approved University or College, and must prosecute a course of special study or research for two or three years and give evidence of satisfactory progress. A thesis must be presented for approval by the Senate and the candidate may be required to undergo an oral or other examination on the subject matter of the thesis

Clinical studies are carried on at the Glasgow Royal Infirmary, Glasgow Western Infirmary, the Victoria Infirmary, and to an increasing extent in the Corporation Hospitals of the city. Facilities for the study of special branches are afforded by the Royal Hospital for Sick Children, the Royal Mental Hospital, Hawkhead Asylum, the City Fever Hospitals, the Royal Maternity Hospital, the Samaritan Hospital, the Eye Infirmary, the Ophthalmic Institution, and others, and in the tuberculosis and venereal disease clinics of the city.

Anderson College of Medicine

This medical school dates back to the year 1800. Many of the most distinguished physicians and surgeons in Glasgow have been connected with it, and it has given 18 professors to the University of Glasgow, one of whom at present holds office. About 700 students attend the various classes in the year.

Courses are given which qualify for all the licensing boards and for the Universities of Oxford, Cambridge, London, Edinburgh, and Glasgow (the latter two under certain conditions) Extensive accommodation is provided for practical anatomy, chemistry, botany, zoology, physiology, pharmacy, and operative surgery. New laboratories for biology and physiology were built last year Women students are admitted on the same terms as men, and the Carnegie Trust extends its benefactions to students of the College Candidates for the L.D S can obtain the full medical curriculum; the courses special to dentistry are conducted at the Dental Hospital, Glasgow.

Glasgow Western Infirmary

This hospital of 625 beds, which is adjacent to the university, controls also the David Elder Infirmary (50 beds) and a convalescent home (40 beds) In addition to general medical and surgical wards there are special departments of gynæcology, oto rhino-laryngology, dermatology and ophthalmology, the last being housed in a new building and specially equipped for post-graduate work. In the out-patient department there are dietetic, neurological, dental and venereal disease clinics, as well as clinics in all the subjects previously mentioned There is also a fully equipped radiological department, both diagnostic and therapeutic, a radium department, which is one of the centres for Glasgow and the West of Scotland, and a department for massage and electrotherapeutics The most recent addition is the Gardiner Institute of Medicine for teaching and research The clinical courses are given by the physicians and surgeons, each of whom conducts a separate class, and students must enter their names at the beginning of the session for the class which

they propose to attend Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class Eighteen resident assistants are appointed every six months from those who have completed the curriculum, and post-graduate courses are also given

Glasgow Royal Infirmary

Glasgow Royal Infirmary is the oldest and largest voluntary hospital in Glasgow It is situated in the east end of the city, adjacent to St Mungo's Medical College, and contains nominally 794 beds It is a general hospital with 22 wards devoted to general surgery and 10 to medicine The special departments include wards for the treatment of burns, diseases of the ear, nose, and throat, skin diseases, diseases peculiar to women, urological diseases There are also wards for metabolic examinations and treatment by oxygen therapy The Infirmary is a national radium centre for the treatment of cases of malignant disease and such other conditions as demand radiation The orthopædic department includes a large massage department and school of massage for male students There are also vaccination, dental, dietetic, and nervous and mental diseases clinics The pathological institute comprises a large pathological block, bacteriological and biochemical departments, and a fully stocked pathological museum There is a very large out-patient department, where there are nearly half a million attendances of patients annually

The teaching staff includes four professors—of surgery, medicine, pathology, and diseases of women—who hold chairs in the University of Glasgow; nine lecturers appointed by the University, four honorary clinical lecturers in clinical medicine, five honorary clinical lecturers in clinical surgery (all appointed by the University), and numerous assistants to various departments There are also Hall Fellows specially appointed, who act as clinical tutors Full facilities are given to medical students for instruction in systematic and clinical medicine and surgery, pathology, diseases of women, laryngology, rhinology, otology, &c The ophthalmic work is carried on at the Ophthalmic Institution, containing 30 beds, under the management of the Infirmary

An auxiliary hospital with 80 beds for patients in the early stages of convalescence, and 44 beds for paying patients of moderate means, was opened at Canniesburn, about seven miles from the middle of the city, last year The large new out patient department adjoining the Infirmary, which is being built at a cost of £100,000, should be ready before the end of this year It will include a rehabilitation clinic for the treatment of fractures and other injuries Post graduate classes are also conducted at the Infirmary and the Institution, and post graduate clinical assistantships are available for a limited number of students Sixteen resident surgeons and physicians are appointed every six months, and 15 non resident surgeons and physicians are also appointed for the same period

St Mungo's College

This is the medical school of the Royal Infirmary, which is the largest general hospital in Glasgow The Infirmary is situated in Cathedral Square, Castle Street, and has car communication with every part of the city St Mungo's College, which has accommodation for over 300 students, is in the Infirmary grounds and affords full courses in all the subjects of the medical curriculum and in all the medical subjects of the dental curriculum The classes qualify for the medical and dental qualifications of the English, Scotch, and Irish Conjoint Boards, and, under certain conditions, for the various universities, including the University of London Students who have fulfilled the conditions of the Carnegie Trust are eligible for the benefits of this Trust during the whole course of their studies at St Mungo's College. Further particulars can be obtained from the secretary of the medical faculty

Victoria Infirmary

This institution, situated at Langside, and having its office at 40, St Vincent place, Glasgow, has 495 beds, and is the third of the extensive general hospitals in Glasgow to afford opportunity for clinical instruction to students In addition to a full general staff there is a clinical research laboratory with pathologists and bacteriologists attached, radiological instructor, and a full staff of specialists. The Bellahouston Dispensary, also with a clinical staff, is conducted in connexion with the Victoria Infirmary The paying patient's wing has accommodation for 80 patients

Royal Hospital for Sick Children, Glasgow

This institution consists of (1) a hospital at Yorkhill containing 300 cots, built on an elevated and central site close to the University, (2) an out-patient department in West Graham street, and (3) a branch at Drumchapel, containing 80 cots There are one professorship and four lectureships in the University of Glasgow in connexion with the hospital, one professorship and one lectureship on the medical diseases of infancy and childhood one lectureship on surgery and orthopædics in relation to infancy and childhood, one lectureship on bio chemistry in relation to infancy and childhood, and one research lectureship on the pathology of the diseases of infancy and childhood The lectures are both systematic and clinical, but particularly and chiefly the latter In addition, special facilities are given for post graduate study Resident house physicians and surgeons are appointed every six months, in April and October

Royal Maternity and Women's Hospital

The average number of patients in the hospital at Rottenrow is 169 and over 4000 mothers per annum are attended in their own homes. The work of the antenatal wards with their 50 beds is supplemented by large antenatal clinics where over 5000 new patients are seen in the course of the year. Well equipped research laboratories were opened in 1926. A full-time director of research has been appointed A pediatrician gives daily attendance and the practice of the hospital affords a good field for post graduate study There are 9 resident appointments

Royal Samaritan Hospital for Women

The hospital has 190 beds, of which 30 are for paying patients, and offers excellent facilities for clinical instruction in the diseases peculiar to women A radiological department with the most modern apparatus for treatment has been opened Lectures and clinical demonstrations are given by members of the surgical staff There is a complete course each University term for University students and one course in the summer term for College students A post graduate course is held during the summer months and a series of demonstrations for general practitioners is carried out in the winter

Glasgow Lock Hospital

The hospital at 41, Rottenrow, Glasgow, founded in 1807, contains 84 beds and 16 cots for the treatment of females suffering from venereal diseases. There is also a labour ward, and a well-equipped dispensary for out-patient attendances. There is a bacteriological laboratory, equipped with modern appliances, where continuous research work is done. Large University classes are held on the subject of female venereal disease Post-graduate classes are also held. Recently the hospital has been completely renovated and modernised. For 15 years with 614 births in the hospital there has not been a single case of ophthalmia neonatorum and practically no cases of puerperal pyrexia.

Propaganda work in the form of lectures by one of the staff to members of the public has been carried on for some years These deal with the nature, prevention and cure of the disease, and have been found of great benefit.

During the year treatment with M. & B 693 has been found of great effect, and it is hoped to reduce the period of infectiveness of gonorrhœa by such therapy.

Glasgow Eye Infirmary

The number of beds in the Infirmary has now been increased to 120 and its patients come from the whole of Scotland. One chief and two assistant resident surgeons are appointed regularly to the staff. The new outdoor dispensary, which was opened in October, has excellent facilities for instruction Student classes and post-graduate courses are held at the Infirmary The total attendances for the year 1938 at the dispensaries in Glasgow were 87,647.

Glasgow Ear, Nose and Throat Hospital

The hospital contains 84 beds and cots. At out-patient and indoor departments at 306, St Vincent-street, clinical instruction is given A research department has been installed and post-graduate courses are held during the year Recognised by the University as a teaching school in diseases of the throat, nose, and ear.

A new extension containing 20 beds is now built with a lecture hall and special rooms for endoscopy.

Any further particulars may be obtained from the senior surgeon, 306, St. Vincent-street, Glasgow, C 3

UNIVERSITY OF ST. ANDREWS

St. Andrews, though the oldest Scottish University, was the last to institute a full curriculum in medicine She had one or two medical professorships and at one time conferred a degree of doctor of medicine after examination, but the present medical school really dates from 1897, since when it has grown steadily until now more students apply for admission than the clinical facilities can cope with. Accordingly the number of students allowed to enter the first year course is restricted to about 55, and only those willing to take the full curriculum are selected. Both women and men are admitted. The training may be taken wholly in Dundee or the first two years may be spent in St. Andrews All must spend the last three (clinical) years in Dundee. In both cities full professorial staffs are available and the laboratories and teaching facilities are equally good.

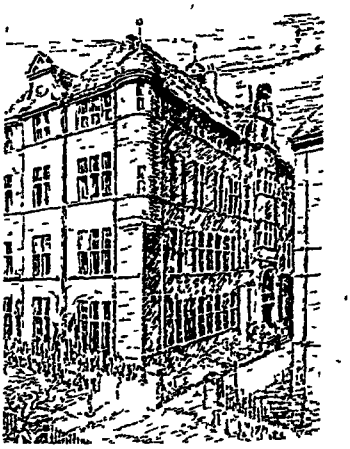
The entrance requirement is the possession of the certificate of fitness of the Scottish Universities entrance board. There is no pre-registration examination in physics and chemistry.

Scholarships —Valuable bursaries of £40–£50 a year for 3–4 years are available both in Dundee and St Andrews In St. Andrews there are also residential scholarships of £100 a year which meet the cost of hostel accommodation and pocket-money. These are not restricted to medical students but are open to all sitting the entrance bursary competitions There are a few bursaries of £40 a year for 4 years, restricted to medical students (2 for male and 4–6 for female students).

Fees and cost of living —Though classes may be paid for individually, advantage is usually taken of the arrangement whereby a composite fee is spread equally over the five years The annual payment, including clinical classes, is £36 8*s* There is also an annual matriculation fee of £2 12*s*. 6*d*, and a small charge to cover the cost of laboratory material, &c. The hospital fee is £4 4*s*. a year for the last three years.

St. Andrews is well supplied with hostels for both male and female students The charge for the 30 teaching weeks of the year is £63 for men and £65 for women, exclusive of personal laundry. Board-residence in rooms is very good in St. Andrews and averages 30*s* a week for men and 28*s* a week for women. In Dundee there is good but smaller hostel accommodation, but lodgings are not so good A certain number of clinical clerkships in hospitals and asylums offer free board and lodging to senior students. Local students, comprising about a third of the total, live at home and travel up daily.

There are four examinations for the degree of M.B., Ch.B. The first, in botany, zoology, chemistry, and physics, can be taken during the first year; the second, in anatomy and physiology, at the end of the second year. Until he has passed the second examination a student cannot proceed with clinical work. The third examination is divided into two parts The first part, taken at the end of the third year, comprises materia medica, pathology, and bacteriology. The second part, in public health and forensic medicine, is taken at the end of the fourth year. Up to this stage each subject may be entered for and taken singly, but in the fourth or final examination the candidate must enter for all three subjects (medicine, surgery, and midwifery) together. He may, however, pass in either one or two subjects if he obtains high marks, but he must complete the entire examination within 19 months



The main clinical teaching hospital is the Dundee Royal Infirmary, which covers most of the clinical work. There is also teaching at various recognised municipal hospitals and institutions Owing to the comparatively small number of students admitted each year, an unusually large proportion of graduates are able to obtain resident hospital posts

The degrees of *Doctor of Medicine* and *Master of Surgery* are conferred after a clinical examination and the presentation of a thesis The clinical examination may be and usually is taken separately; an arrangement which makes it very much easier for recently qualified practitioners to proceed to the doctorate or mastership

Dundee Royal Infirmary

This institution has 450 beds In addition to the ordinary medical and surgical wards, there are special departments for midwifery (in- and out door), for diseases of women, of children, of the eye, of the ear, nose, and throat, and of the skin, and for pathology, radiology, electrotherapeusis, and electrocardiography The radiological department has recently been reconstructed and developed Clinical teaching is given to students by the honorary staff, post mortem examinations are conducted by the pathologist All courses of instruction are recognised by the University of St Andrews and the other universities and boards of the United Kingdom Eleven resident medical officers are appointed every six months Clinical clerks and dressers are attached to the physicians and surgeons Post graduate classes dealing with general medicine and surgery, midwifery, and other special branches are held in June

SURGEON'S HALL

The School of Medicine of the Royal Colleges, Edinburgh, owes its origin to the foundation of the Incorporation of Barber Surgeons by the town council in 1505 Regular teachers of anatomy were appointed by the Incorporation in 1697, thirty years before the foundation of the medical faculty of Edinburgh University During the eighteenth century the medical schools of the university and the extramural school grew side by side, many of the lecturers being common to both, but it was not until after some lengthy litigation in the 1850's that the classes of the extramural school were recognised as qualifying for the university degree

The lecturers, who now number forty, are licensed by the Royal Colleges after a special examination The school holds no professional examinations of its own but prepares students for the degrees of Edinburgh, London, and other universities or more usually for the qualifying examinations of the Scottish, English, or Irish Conjoint Boards Students reading for an Edinburgh degree must attend half their qualifying classes in the university The number of students averages over 700 The clinical work is done mainly in the Royal Infirmary, the other classes being held in Surgeons Hall, New School, and other buildings Board and lodgings can be had near the school for from £2 to £3 a week The minimum cost of the course for the Scottish Conjoint qualification, including tuition and examination fees, is £200

Further details, with particulars of the prizes and bursaries offered, may be had from the dean at Surgeons Hall, Nicolson street, Edinburgh

MEDICAL SCHOOLS OF IRELAND

UNIVERSITY OF DUBLIN

TRINITY COLLEGE

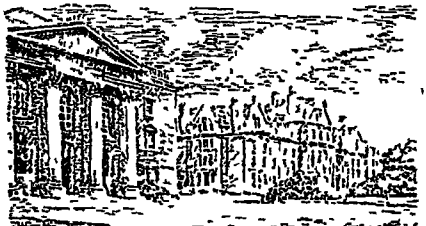
Trinity College was founded by Queen Elizabeth in 1591 as "mater Universitatis" and is still the single College of the University of Dublin Medical degrees were granted almost from its foundation, but medical training did not begin until 1654, when the College of Physicians was established Teaching in medical subjects in Trinity College was begun in 1711, from which date it has been continued without interruption The "School of Physic in Ireland," although situated in Trinity College, was a conjoint school of Trinity College and the College of Physicians from 1749 until 1800 A number of the professors in it were appointed and the examinations for medical degrees were conducted by the latter College Since 1800 the School of Physic in Ireland has been entirely under the control of Trinity College, although the Royal College of Physicians still appoints four of its professors

The buildings of the medical school are all modern and its laboratories are well equipped for teaching and research The number of undergraduate students is 510 and of post graduate students 14

Before admission students must pass an entrance examination in English mathematics, history, geography, Latin, and either French German, Greek, Irish, Italian, or Spanish The matriculation examination of a recognised university or a school leaving certificate will be accepted in lieu of the above, if passed in the required subjects On obtaining credit for entrance, the student will be admitted to the courses of the premedical year which will be devoted to physics, chemistry, botany, zoology and the first year of the arts course All medical students are required to take an arts course and the degree of B A before the medical degrees can be conferred upon them The following arts examinations must be passed the junior freshman examination, the senior freshman examination, and the B A degree examination

On passing the pre registration examination (physics and chemistry) and the junior freshman examination, the student will be registered as a medical student and may proceed with the five years' medical course beginning in October

For the degrees of M B , B Ch , B A O the following examinations must be passed preliminary scientific



medical examination (botany and zoology) either during the premedical or first medical year, first medical examination (anatomy, physiology, bio chemistry and histology) at the end of the second term of the second medical year, second medical examination (pathology and bacteriology, materia medica, therapeutics and pharmacy) at the end of the third medical year, final medical examination in (a) midwifery, (b) medicine, medical jurisprudence, and hygiene, and (c) surgery, at the end of the fifth medical year The three parts of the final examination must be passed within a period of 10 months

Entrance scholarships—The following are awarded annually on the results of examinations in subjects of general education: Scholarship of £50 per annum for four

Dr. Robert Fellx Library

and is in addition an official treatment centre for venereal diseases. The practice of the hospital is open to all students and classes are held every morning from the beginning of October to the end of June Facilities for post-graduate study are also provided.

A resident surgeon, resident physician, and resident casualty officer are appointed. These are salaried posts and are held for six months, the holder of one resident post being permitted to apply at the end of his six months' service for another. From six to nine resident students are appointed every three months. There are facilities for women students.

Adelaide Hospital

This year the hospital celebrates its centenary. It is the only clinical hospital which does not benefit from the Irish hospitals' sweepstakes. There are 163 beds, and last year 2050 in-patients were admitted and 42,797 cases were treated in the out-patients' department There are special X ray, electrocardiographic, biochemical, dermatological, gynæcological, ear, nose, and throat, and tuberculosis departments and the hospital is the training ground of the Dublin School of Massage Medical and surgical instruction is given in the wards and out-patient departments daily, with special classes for junior students. Two resident surgeons are elected every six months, and six or more resident students are elected every four months The Hudson scholarship of £30 and a gold medal, as well as the Hudson prize of £10 and a silver medal, are awarded at the end of the session for proficiency in medicine, surgery, gynæcology, and pathology. In addition to this, prizes are awarded in gynæcology and dermatology, and in clinical medicine and surgery for junior students Wallace Beatty memorial bursaries are granted at the discretion of the Medical Board to students who need financial assistance.

Mater Misericordiæ Hospital

This general hospital, under the care of the Sisters of Mercy, contains 300 beds with 96 beds in the private home Clinical instruction is given by the staff Connected with the hospital are extensive dispensaries and laboratories, a fully equipped biochemical laboratory, a modern electro-massage department, an electrocardiograph room, and radiological department (diagnostic, superficial, and deep therapy) Instruction is given in pathology and bacteriology. Four house physicians, 16 house surgeons, and 36 resident pupils are elected annually, and students are appointed as dressers and clinical clerks There is a private hospital for medical and surgical cases A training school and a home for trained nurses are connected with the hospital Particulars can be obtained from any of the physicians or surgeons or the registrar, 8, Fitzwilliam-place, Dublin

Mercer's Hospital

This hospital, with 106 beds, is situated in the centre of the city of Dublin, in closest proximity to the medical schools. From its position it receives a large number of cases of emergency surgery in addition to the ordinary medical and surgical practice Extensive alterations and reconstruction have brought the wards up to date Additions have been made in the radiographic and electrocardiographic departments Classes for pupils are held on alternate mornings in the medical and surgical wards There is a large out-patient department available for the teaching of medicine, surgery, and gynæcology. Arrangements for clinical instruction are made with Cork-street Fever Hospital. A house surgeon and a house physician are appointed annually, and there is residential accommodation for six men and two women pupils. Clinical clerks and dressers are appointed from the classes.

Richmond, Whitworth, and Hardwicke Hospitals

These House of Industry hospitals, North Brunswick-street, Dublin, contain 325 beds—140 for surgical cases, 75 for medical cases, 78 for fever and other epidemic diseases, and an auxiliary wing with 32 beds, devoted mainly to throat, nose, and ear, and skin diseases. Three resident physicians and three resident surgeons are appointed each half-year. Resident clinical clerks are appointed each quarter, and it has always been the aim of the medical board to ensure that each student spends at least six months in residence The new students' residency accommodates 20 male and 8 female students. In addition, junior students are appointed as extern clinical clerks and surgical dressers Women students are eligible on the same terms as men. Ample facilities exist for post-graduate work in the various special departments, as well as in general medicine and surgery.

Royal City of Dublin Hospital

The hospital contains 160 beds and a special wing for the treatment of fevers and contagious diseases There is a large nursery where special opportunities are afforded for the study of diseases of children, both medical and surgical. There are also special wards for ophthalmic, aural, and gynæcological cases; also a department for the Erlangen treatment by deep therapy. There is a largely attended out-patient department, where students are allowed to attend accidents and dress cases under supervision Six resident pupils are appointed every three months. A house surgeon and a house physician are appointed annually.

Dr. Steevens' Hospital

This hospital, at Kingsbridge, Dublin, contains 197 beds There is accommodation for 10 resident pupils, and board is supplied by the hospital at a reasonable rate There are massage, "sun-ray" and diathermy, X ray, and pathological departments The X ray equipment has been renewed and a new tomograph installed, as well as a short-wave diathermy, electrocardiograph, and gastroscope There are also two V.D wards and a largely attended V.D treatment centre, as well as a large open air ward for tuberculous and other diseases of bone (25 beds) for females, two open-air verandahs for male surgical tubercular cases (14 beds) and children's ward (12 cots) Daily clinical instruction in medicine, surgery, and X ray is given to extern students There is also a large fracture clinic

Meath Hospital and County Dublin Infirmary

The hospital contains 156 beds, available for clinical teaching, both medical and surgical A special surgical ward has been set apart for the reception of children. Special departments are as follows: ear, nose, and throat, dental, diseases of women, skin, and genito-urinary system Clinical teaching includes classes for both senior and junior students The Joseph Smyth scholarship in medicine, value £35, is awarded annually. Two house surgeons, a resident casualty officer, and two house physicians are selected each half-year from fully qualified pupils of the hospital. The new students' quarters include accommodation for resident lady pupils.

Jervis Street Hospital

This hospital contains 146 beds Six resident medical officers are appointed each year and facility is thus given to past students of the hospital to acquire experience as house surgeons Resident students are provided with apartments, fuel, and light, free of charge Arrangements have been made by which students of the hospital can have special fever training in Cork-street Fever Hospital

St. Vincent's Hospital

This hospital was founded in 1834 and has been administered since by the Sisters of Charity Admission is free to the poor without any distinction of creed The general hospital contains 176 beds and is equipped with medical, surgical, gynæcological, pathological, radiological, and other special departments The resident staff consists of a senior resident medical officer, and four intern and two extern medical officers In the out patient department special dispensaries are open once a week for diseases of the skin and rheumatism in children, as is a general evening clinic for the convenience of working people A private home is attached and staffed by sisters and nurses who have been trained in the hospital Proposals for the reconstruction of the hospital are now under consideration Clinical lectures in medicine and surgery are held from October to June, the junior class is held from October to April

Rotunda Hospital

This is the largest combined gynæcological and maternity hospital in the British Empire It has 151 beds and over 4800 confinements are attended annually, and upwards of 1000 gynæcological patients admitted Students can take their necessary gynæcological and midwifery practical courses The work of the hospital is carried on continuously through the year, and consists of daily clinical instruction in the maternity department and examination and operations in the gynæcological department Qualified students are given facilities for studying and assisting in the management of all abnormal cases so far as is practical They also assist in rotation at gynæcological operations, and if staying more than two months are personally allowed to perform some minor ones An antenatal clinic the infant department, and dispensary are available also A special class in gynæcological examination and diagnosis is conducted by the assistants to the master In addition there is a special class in operative obstetrics The pathological laboratory has been considerably enlarged and offers convenient facilities for practice work to post-graduates and students A biochemist on the staff is carrying out the Aschheim Zondek test for pregnancy, and is prepared to help any post graduates who are keen on doing research work A new X ray plant has been installed which greatly facilitates the study of this important and to obstetrics In the infant department a pædiatrician gives instruction daily The appointments on the staff of the hospital are given to qualified past students of the hospital who have taken the L M two resident assistant masters and two resident clinical clerks are appointed from these Women students can reside in the hospital on the same terms as men Board and residence can be obtained in the hospital Tennis-courts and a squash racket court are available for students in the residents' mess The L M certificate is given to qualified practitioners on examination after six months' attendance (four months in the case of those who took their midwifery training in the hospital) Fees one month, £6 6s , months other than first, £4 4s , three months, £12 12s L M course £21

Coombe Lying-in Hospital

The Coombe Lying in Hospital and Guinness Dispensary for the treatment of diseases peculiar to women, contains 86 beds, and consists of two divisions, one of which is devoted to midwifery and the other to gynæcological cases The hospital gives to men and women students and post graduates a thorough training in obstetrics and gynæcology Lectures are delivered, practical instruction given, and gynæcological operations are performed daily There is a special afternoon dispensary held by the master and his assistants, at which practical instruction in gynæcology is given There is no extra charge for attendance at this dispensary, or at the prenatal clinic, held on three evenings a week, at which there are about 4000 attendances annually Every year about 1200 women are delivered in the hospital and about 1600 in the district A temporary annexe containing a labour ward unit and 26 beds was opened last November An infant clinic, at which over 600 infants are treated yearly, has been established, there is accommodation for intern pupils, and women students can reside in the hospital

National Maternity Hospital

This new hospital in Holles street is now in full working order It has 150 beds and comprises ante natal, puerperal, postnatal, and gynæcological departments, and an isolation unit It also deals with an extensive extern maternity department There is a *large daily attendance at the antenatal and gynæcological* dispensaries in the out-patients' department, and at the weekly infants' dispensary The hospital courses are continuous during the year and students can join at any time Clinical instruction and oral lectures are given daily, and gynæcological operations performed on three days a week The L M diploma is granted after a three months' residential post-graduate course The examination for this diploma is held quarterly Last year the total number of admissions to the hospital was 3587, of which 2964 were maternity patients and 623 gynæcological, 2568 patients were delivered in the hospital and 705 were delivered in the district, and 12,688 adults and 1886 infants attended the out-patient department New X ray and pathological departments are now completed

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QUEEN'S UNIVERSITY OF BELFAST

The medical school may be said to date from the foundation of a medical faculty of the Royal Belfast Academical Institution in 1831, *though* the staff of the General Hospital in Frederick street had been *taking pupils* for many years before In 1845 letters patent were issued for the establishment of Queen's College as a part of the Queen's University of Ireland and of the 195 students of the new college 28 were *studying medicine* In 1879 Parliament abolished the Queen's University and set up the Royal University, an examining body rather on the lines of London University, which drew its candidates and examiners from all sources, though mainly from the three Queen's Colleges of Belfast, Cork and Galway This arrangement did not provide the solution of the Irish University problem, and finally in 1908 two new Universities were created, the Queen's University of Belfast, and the National University of Ireland, with its constituent colleges in Dublin, Cork, and

Galway. During the Royal University period the progress of the medical school was slow: in 1879 there were 230 students, in 1908 250; but by 1926 there were 356 and now there are over 650, including about 90 women.

The school covers the whole curriculum and, thanks to the generosity of numerous benefactors,

is well-equipped with lecture rooms, dissecting-rooms, laboratories, and facilities for research in all departments

Admission.—Students entering the faculty of medicine must satisfy the following conditions.—

(*a*) Before entering the faculty they must pass (1) the matriculation examination, (2) a qualifying examination in Latin, and (3) the premedical examination in chemistry and physics, or other examination recognised as equivalent.

(*b*) After entering the faculty but before registration as medical students, they must pass the University medical examinations in physics and chemistry.

(*c*) After registration as medical students, they must spend not less than five academic years pursuing a certified course of study before presenting themselves for the final examination.

(*d*) They must be 17 years of age by July 15th of the year in which they are to commence the registration course in physics and chemistry.

The course for the degrees of M.B., B.Ch., B.A.O. is: *First year*. Chemistry (inorganic and organic), experimental physics, zoology and botany. Pre-registration examination at end of second term. Summer term, elementary anatomy and physiology. *Second year*. Anatomy, physiology and biochemistry. Examination in anatomy Part I at end of third term. *Third year*. First term, anatomy and physiology. Examination at end of this term in anatomy Part II, and physiology and biochemistry. Second and third terms, materia medica and pharmacology, pathology, and bacteriology, elementary medicine and surgery. Examination at end of third term in pharmacology, pathology and bacteriology. *Fourth year*. Hygiene, medical jurisprudence and toxicology, surgery, medicine, obstetrics and gynæcology, ophthalmology and otology. Examination at end of second term in hygiene, medical jurisprudence and toxicology. Third term, clinical pathology and operative surgery. *Fifth year*. No formal lectures, clinical study only. Operative surgery instruction on the cadaver. Final examination at end of second term.

Fees and cost of living.—The total tuition fees for the five years' course are about £250. There are two hostels for students: Riddell Hall for women, with accommodation for 42 students at £15 a term, and Queen's Chambers for men, accommodating 40 students at £14 a term.

The degrees of *Doctor of Medicine*, *Master of Surgery*, and *Master of Obstetrics* (M.A.O.) are not conferred until at least 3, or, in the case of graduates of the University in arts or science, at least 2 years, after admission to the degree of M.B. The degrees may be conferred by the Senate either (*a*) after an examination, which includes written, oral, clinical, and practical examinations; or (*b*) on the submission of a thesis or other evidence of original research or study to be approved by the faculty of medicine after an oral or other examination on the subject.

Clinical instruction is given at: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Belfast Hospital for Sick Children, the Royal Maternity Infirmary and Hospital, the Ulster Hospital for Women and Children (56 beds), the Benn Ulster Eye, Ear, and Throat Hospital (30 beds), the Belfast Ophthalmic Hospital (30 beds), the City Fever Hospital (360 beds), the Union Fever Hospital (200 beds), and the Belfast District Lunatic Asylum (1350 beds).

Royal Victoria Hospital, Belfast

The hospital was opened in 1903 to replace the old Royal Hospital in Frederick-street. It cost £120,000 to erect and much more has since been spent on extensions, so that to-day it is one of the best-equipped general hospitals in Europe. It has 538 beds and admits some 7000 patients a year. Resident pupilships of two months each are allotted to 48 students every year, including women. There are 13 resident house surgeons and house physicians and a resident bacteriologist and bio-chemist.

Mater Infirmorum Hospital

The hospital began in a small way in 1883 under the care of the Sisters of Mercy, but since then it has extended in many directions and was entirely rebuilt in 1900. Now it has 270 beds and treats nearly 4000 in-patients a year. Recent additions have been a new extern, a fine nurses' home, remodelled operating-theatres, and new X ray plant. Clinical instruction is given daily in the wards by the physicians and surgeons and teaching is also carried on in the out-patient departments. In accordance with the recommendations of the General Medical Council accommodation has been provided for eight resident students, and a house physician and two house surgeons are elected every six months Three exhibitions and a gold medal are competed for annually in June

Belfast Hospital for Sick Children

Adjacent to the Royal Victoria Hospital, Royal Maternity Hospital, and Pathological Institute of the University, this hospital is most conveniently situated for medical students. Courses of lectures are given by the staff on medical and surgical diseases incidental to infancy and childhood, and the certificate granted by the Hospital in diseases of children is recognised by the various examining bodies. There are at present 86 beds and cots The extern departments are very large and provide excellent material for the student, special attention being devoted to orthopædics. Demonstrations in ophthalmology and pathology are given, and there is a dental department A speech-therapy clinic has lately been started. There is a gold medal competition for final year students The Davis scholarship is awarded for the best thesis on some phase of children's diseases, graduates of not more than four years' standing being eligible to compete. There are three resident house surgeons.

Belfast Infirmary and Hospital

The old poor-law hospital was founded in 1840, since when it has steadily been added to and improved. It now has 1900 beds, with special departments for different categories of patients: the Abercorn Hos-

pital for cancer and observation cases, the Windsor Hospital for imbeciles and epileptics, the Dufferin and Ava Hospital for children and mothers with infants, the Jubilee Hospital for antenatal, maternity, and gynæcological patients, and separate accommodation for chronic and infirm patients There are wards for tuberculous patients, although when possible these are transferred to the Municipal Sanatorium The Fever Hospital accommodates non notifiable infectious cases and others during epidemics A limited number of resident medical students are admitted There are 10 visiting medical officers and 8 resident medical officers and arrangements to appoint a resident medical superintendent for the hospital department are under consideration

Royal Maternity Hospital

This building is in the grounds of the Royal Victoria Hospital There are 100 beds and an antenatal department catering for a large district There is also an infant clinic and a separate isolation block for the treatment of puerperal sepsis The university obstetric tutor resides in the hospital and acts as senior resident medical officer He is assisted by three house surgeons, and resident accommodation is provided for 15 students or post-graduates

SCHOOLS OF SURGERY

The Schools of Surgery are attached by Charter to the Royal College of Surgeons and have existed as a department of the College for over a century They are carried on within the College buildings in St Stephen's Green, and are subject to the supervision and control of the Council The schools are in the centre of Dublin, conveniently near many of the hospitals The buildings have been reconstructed, the capacity of the dissecting room nearly trebled, and pathological and bacteriological laboratories refitted. There are excellent playing fields in the suburbs of Dublin, and flourishing football and athletic clubs and medical and literary societies The students, who now number between 400 and 500, live in lodgings or at home

Scholarships and prizes Carmichael scholarship, £15, Mayne scholarship, £8, Stoney memorial gold medal, operative surgery gold and silver medals, Barker prize, £26 5s, H Macnaughton-Jones gold medal in obstetrics and gynæcology, and class prizes and medals

Prospectus can be obtained from the registrar, Royal College of Surgeons, Stephen's Green West, Dublin

EXAMINING BOARDS

ENGLISH CONJOINT BOARD

ROYAL COLLEGE OF PHYSICIANS OF LONDON
ROYAL COLLEGE OF SURGEONS OF ENGLAND
M.R.C.S., L.R.C.P.

ALL the schools described under the heading of the Universities to which they are attached are *recognised as suitable places of instruction* by the corporations granting medical diplomas, and special studies can also be pursued at certain metropolitan and other hospitals mentioned below The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations

Students of the Royal Colleges must pass a preliminary examination in general education recognised by the Board, and a *premedical examination* in chemistry, physics, and elementary biology conducted by the Board before commencing the five years' curriculum of professional study They may be exempted from the premedical examination if they have passed the examination in chemistry, physics, and biology for the degree in medicine of any university recognised by the Board, the higher school certificates of Oxford and Cambridge Universities and the Oxford and Cambridge Schools Examination Board, the higher certificates of London, Bristol, Durham Universities, the Joint Matriculation Board of the Northern Universities, or the Central Welsh Board higher certificate

There are two professional examinations called the first and final examinations The subjects of the *first professional examination* are Part I (*a*) anatomy, including histology and embryology, (*b*) physiology, including biochemistry Part II Pharmacology and materia medica A candidate must have attended at a recognised medical school courses of instruction in anatomy (including embryology), physiology (including biochemistry), pharmacology and materia medica A candidate may present himself for the two parts together or separately, but he must take sections (*a*) and (*b*) of part I together until he has passed in one or both, but a candidate will not be allowed to pass in one section unless he obtains at the same time at least half the number of marks required to pass in the other section

Part II of the examination may be passed at any time before the candidate enters for the final examination, provided that the courses for part I have been completed A candidate who passed an examination in the subjects of part I or of either section of part I and of part II in the examination for the degree in medicine conducted at a university recognised by the Board will be exempted from further examination in such subjects

The subjects of the *final professional examination* are Part I, pathology (including morbid anatomy, morbid histology, and clinical pathology) and bacteriology Part II, medicine, including medical anatomy, forensic medicine, and public health Part III, surgery, including surgical anatomy and the use of surgical appliances Part IV, midwifery and gynæcology The examination is partly written, partly practical, partly clinical, and partly oral A candidate may take the four parts separately or the whole examination together, but part IV must not be taken until the other three parts have been passed, unless it is taken concurrently with the remaining part or parts which have not been previously passed

Members of recognised universities outside the British possessions are admissible to the examinations under special conditions Graduates in medicine and surgery are required to pass the first examination and to complete 36 months' hospital practice before admission to any part of the final examination Undergraduates are required to complete the full curriculum, after passing the premedical examination

Members of certain recognised Indian Colonial, and foreign universities who have passed examinations for the degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the first examination may present themselves for the final examination under special conditions

The following provincial general hospitals are recognised for reference study in medicine and surgery for the final examination: Royal United Hospital, Bath, Bedford County Hospital; Bradford Royal Infirmary; Royal Sussex County Hospital, Kent and Canterbury Hospital; Coventry and Warwickshire Hospital, Derbyshire Royal Infirmary, Royal Devon and Exeter Hospital; Gloucestershire Royal Infirmary; Royal Surrey County Hospital, Halifax Royal Infirmary, East Suffolk and Ipswich Hospital, Leicester Royal Infirmary, Ancoats Hospital, Manchester, Northampton General Hospital, Norfolk and Norwich Hospital; Nottingham General Hospital; South Devon and East Cornwall Hospital, Royal Portsmouth Hospital, Preston Royal Infirmary, Royal Berkshire Hospital, Salford Royal Hospital, Royal South Hants Hospital; Staffordshire General Infirmary, Swansea General Hospital, Royal Hants County Hospital, Worcester Royal Infirmary, York County Hospital

Further particulars from the secretary, Examination Hall, Queen-square, London, W.C 1.

SOCIETY OF APOTHECARIES

L M S.S A. LOND.

The premedical and primary examinations are held quarterly. The *Premedical* includes chemistry, physics, and elementary biology. The *Primary* includes anatomy, physiology and histology, materia medica, pharmacy, and pharmacology. The latter examination cannot be passed before the completion of five terms' physiology and practical anatomy with demonstrations, and the first two subjects cannot be taken separately except in the event of the candidate having previously passed in one, and obtained at least half the marks required to pass in the other.

The *Final Examination* for the licence (L M S S A. Lond) is held monthly, except in September, and is divided into the following sections Section S. Principles and practice of surgery, including surgical pathology, surgical anatomy, operative manipulation, instruments and appliances Section M Principles and practice of medicine, including therapeutics, pharmacology, medical and general pathology, bacteriology, morbid histology, forensic medicine, hygiene, mental diseases, and the theory and practice of vaccination Section O Midwifery, gynæcology, diseases of new-born children, and the use of obstetric instruments The examination is partly written, partly practical, partly clinical, and partly oral Sections S, M. and O may be taken at separate examinations, but midwifery must be taken last unless it is taken concurrently with part or parts which have not previously been passed There is no exemption from any part of the final examination

The minimum period of medical study extends over five years (57 months) and three academic years (33 months) must elapse after a candidate has passed the examination in anatomy and physiology before he can complete the final examination. The course of study for the final examination includes attendance on the surgical and medical practice with post-mortem examinations at a hospital connected with a medical school for a period of three winter and three summer sessions, including a course of practical midwifery, with attendance on 20 midwifery cases The offices of dresser and clinical clerk must have been filled at a hospital or institution recognised by the Society The certificates prescribed by the regulations must be produced before admission to the respective sections of the final examination.

Further information can be obtained from the registrar, Apothecaries Hall, Water-lane, E C.

SCOTTISH CONJOINT BOARD

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH
ROYAL COLLEGE OF SURGEONS OF EDINBURGH
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

L.R.C.P. & S. E., L.R F.P.S. G.

THE Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three bodies. This is the Scottish Conjoint Board The three bodies grant their Single Licences to candidates who already possess legal qualifications in medicine or surgery.

The hospitals which are recognised by the Scottish Conjoint Board as places where professional study for their diplomas can be pursued are all those institutions which feed the medical faculties of the universities, and those which are recognised by the English and Irish Conjoint Boards.

Students desirous of obtaining the Diploma of the Scottish Corporations are required before commencing their professional studies proper to pass preliminary examinations (*a*) in general education, and (*b*) in elementary chemistry and elementary physics, and in the fundamental principles of biology They must then enter their names on the Register of Medical Students kept by the General Medical Council Subsequent to registration they must engage in professional study over a period of not less than five academic years, and pass the prescribed professional examinations

Preliminary examination in general education—This examination may be passed before any of the Boards recognised by the General Medical Council. The Educational Institute of Scotland conducts a Qualifying Preliminary Examination for medical students in Edinburgh and Glasgow Copies of the Regulations may be had on application to the Educational Institute of Scotland, 46 and 47 Moray-place, Edinburgh The candidate must pass in the following subjects (*a*) English (*b*) Elementary mathematics. (*c*) A language other than English (*d*) An additional subject to be chosen from history, geography, logic, English literature, Latin, Greek, Hebrew, French, German, or other language accepted by the university or licensing body for the purpose Exemption may be granted to students who hold a university degree, the preliminary examination for which included all the subjects required by this Board, or who present the "Certificate of Fitness" granted by the Scottish Universities Entrance Board, or an equivalent certificate recognised by the Triple Qualification Board

Preliminary examination in natural sciences—The Board conducts preliminary examinations in the subjects of chemistry, physics, and biology. The examinations are written, practical, and oral, and are held quarterly in Edinburgh or Glasgow Candidates must present themselves for chemistry and physics together, unless they have obtained exemption from one of them Exemption from one or more of the subjects of this examination may be granted to students who have passed an equivalent examination recognised by a University or licensing body for admission to a medical course

Professional curriculum—The period of professional study, between the date of registration as a medical student and the date of the final examination for any diploma which entitles its holder to be registered under the Medical Acts, shall be a period of certified study during not less than five academic years The subjects of study included in the medical curriculum are · (1) The professional scientific subjects: anatomy,

physiology, pharmacology and materia medica, and pathology and bacteriology (2) The clinical subjects medicine, surgery, midwifery and gynæcology, and various special subjects (3) Medicine in relation to the community public health and forensic medicine The first two years shall be devoted to the study of anatomy and physiology with an introduction to clinical methods The last three years shall be devoted to the study of clinical subjects, together with the clinical application of the professional scientific subjects Students shall not pass to the period of clinical studies until they have satisfied the examiners on the subjects of the first and second year

Professional examinations.—Candidates are required to pass three professional examinations, called the first, second and final examinations These are partly written, partly practical and oral, and are held four times in a year A candidate may be exempted from the first or second examination, on the production of a certificate that he has passed an equivalent examination for a medical qualification before one of the recognised Boards

The *first examination* consists of the following subjects (1) Anatomy and embryology, and (2) physiology, including histology, bio chemistry, and bio physics The subjects of this examination must be passed at the same time

The *second examination* consists of the following subjects: (1) pathology, including bacteriology and morbid anatomy, and (2) materia medica and pharmacology (theoretical and practical), including pharmacological chemistry, the principles of therapeutics, and prescription writing Candidates may take Parts (I) and (II) separately, or they may present themselves for both parts at one time

The *Final examination* consists of two parts: I (*a*) forensic medicine and (*b*) public health II (*a*) medicine, including therapeutics, applied anatomy, and physiology, and clinical pathology with clinical medicine, (*b*) surgery, including applied anatomy and physiology, clinical pathology, with clinical surgery, and (*c*) midwifery and diseases of women, clinical obstetrics and gynæcology, with practical midwifery

All candidates for the Triple Qualification must appear for the final examination A candidate must enter for forensic medicine and public health together, unless he has already passed in one of these subjects, and he must enter for medicine, surgery, and midwifery together, unless he has already passed in one or more of these subjects

Part II may be taken at any time after the completion of five winter and five summer sessions of study, provided that a period of thirty three months has elapsed since passing the first professional examination

The registrar in Edinburgh may be addressed at 18, Nicolson street and the registrar in Glasgow at 242 St Vincent street, to whom fees and certificates must be sent for the respective examinations, and from whom particulars of fees can be obtained

SINGLE LICENCES

The Royal College of Physicians of Edinburgh grants its single licence after examination to candidates whose names already appear on the Medical Register

The Royal College of Surgeons of Edinburgh admits to the examination for its single licence candidates of either sex who hold a diploma in medicine of any British, Indian or foreign university or of any British College of Physicians, or of the Society of Apothecaries of London or Apothecaries' Hall, Dublin whose preliminary examination and course of professional study is proved to be sufficient to fulfil the requirements of the College, or those who have passed a full examination for any of the above.

IRISH CONJOINT BOARD

ROYAL COLLEGE OF PHYSICIANS OF IRELAND
ROYAL COLLEGE OF SURGEONS IN IRELAND

L.R.C.P.I. & L.M., L.R.C.S.I. & L.M.

The Conjoint Board of the Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland requires that the candidate should pass either its own preliminary examination in the subjects of general education or proof that the candidate has passed one of the tests accepted by the General Medical Council He must also pass the pre registration examinations in chemistry and physics and biology

Professional examinations.—There are three professional examinations, the first of which cannot be completed earlier than the end of the second winter session, nor the final before the conclusion of five years of medical study Before being admitted to any of them the candidate must show that he has studied the different subjects in practice and theory for the requisite periods, certificates to this effect being accepted from the authorities of most of the recognised medical schools at home and abroad

The *first examination* consists of applied chemistry, anatomy, and physiology The *second examination* deals with (*a*) pathology, (*b*) materia medica, pharmacy, and therapeutics, (*c*) ophthalmology and aural surgery, and may be taken separately The *final examination* is divided into three divisions, which cannot be completed until at least five years have passed in medical studies other than those for the pre registration examinations, and five years at least since the beginning of the curriculum The divisions are (*a*) medicine (including fevers, mental diseases and diseases of children), forensic medicine, hygiene, and public health, (*b*) surgery, including operative surgery, (*c*) midwifery, including diseases of women and children, and the practice of vaccination

SINGLE LICENCES.—The Royal College of Physicians of Ireland issues its licences in medicine and in midwifery to medical men whose names appear on the Registers of the General Medical Council or of Eire

Licence in Medicine.—The subjects of examination are practice of medicine, clinical medicine, pathology, medical jurisprudence, midwifery, hygiene, therapeutics

Licence in Midwifery.—Candidates must produce certificates of registration A registered medical practitioner of five years' standing may be exempted from the written examination

The Royal College of Surgeons in Ireland issues its licence in surgery to practitioners whose names are entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he presents himself for examination, and who satisfies the council that he has passed through a course of study and examinations equivalent to those required by the regulations of the Irish Conjoint Board

Candidates are examined in general surgery (paper and oral) clinical surgery surgical pathology (oral), operative surgery, surgical anatomy (paper), and ophthalmic and aural surgery (clinical)

APOTHECARIES' HALL OF IRELAND

LICENTIATE.

The licence of this Hall is granted to students who present certificates of having fully completed the course of study as laid down in the curriculum and who pass the necessary examinations The diploma of the Hall entitles the holder to be registered as a

practitioner in medicine, surgery, and midwifery, with also the privileges of the Apothecary's licence.

Candidates must pass three professional examinations, called the first and second professional examinations and the final examination, which are conducted at separate times, partly in writing and partly practically and orally. The examinations are held thrice a year, in March, June, and November, or such other dates as may be determined

Candidates who produce satisfactory evidence of having passed an examination for a degree or licence in medicine conducted by any university or Royal College in the British Empire, or by any Foreign university whose degrees are recognised in the foreign list of the Medical Register, will be exempted from the primary examination.

The subjects for the *first professional examination* are: anatomy, physiology, and histology, including biochemistry; and for the *second professional*, materia medica and pharmacy, pathology, and medical jurisprudence and hygiene

For the *final examination* the subjects are: (*a*) medicine and clinical medicine and clinical methods; (*b*) surgery (clinical, ophthalmic, and operative) and surgical anatomy; (*c*) midwifery and gynæcology, and practical pharmacy and materia medica (if not taken at intermediate examination)

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21. The details of the course of education required and syllabus of the examinations will be supplied by the registrar at 95, Merrion-square, Dublin.

We take this opportunity of thanking the officials of Government Departments and the deans and secretaries of the various institutions for their coöperation in enabling us to bring the information contained in our Students Number up to date. The line drawings of universities and medical schools (with the exception of Oxford) were made by Mrs M. A. Clayton-Jones from photographs and prints kindly supplied by local officers.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM DOCTOR DON

IV

I REMEMBER drinking beer with some fellow students in a South Lancashire public-house when one of our number was asked his profession. In fun he answered "A puddler." But the questioner, who was himself an iron-worker, cried out, "You're not a puddler, you're a bleeding clurk" The iron-worker's observations are the germ of an important new science, the science of occupational selection. You can tell just from the sight of the back of a man's neck that he is more likely to enjoy reading the *Pink 'Un* than the *Ode on the Intimations of Immortality*, and the Americans have found that six hours with an instructor in an aeroplane are sufficient to decide with reasonable accuracy whether a man is likely to make a good pilot But how shall we decide whether the man is to fly bombers or fighters? Or which of a group of women going in for teaching is likely to break down in 10–15 years with exophthalmic goitre? How shall we get sufficient skilled craftsmen out of our dull Saxon race to enable industries such as the manufacture of glass, optical instruments, and scientific apparatus to compete a little better against the Germans and Americans? Shall we preselect our doctors-to-be and, if so, how? I felt that an enormous opportunity was missed in not instituting experiments on occupational selection with the new militia, now that mechanised warfare demands so many different specialised abilities; but we doctors can hardly expect to persuade others to follow a course which we are not following ourselves

My own decision to enter medicine was taken late. At school I had specialised in languages with a view to the university and the civil service, but after 2½ years in the Army I was certain I could not live on my intellect alone, without use of my hands and without close contact with people And so I turned to medicine and have never wanted to turn back. It may be different in surgery and obstetrics, but such poetry as medicine brings is in the elegiac vein *sunt lacrimæ rerum*. I remember an old tabetic telling me how he would sometimes awake in the morning, and it was dark, and he would think the sun had not risen. And then he would remember he was blind, and for him the sun would never rise again Or the man whose wife had just died of acute leukæmia, saying "Seven years' perfect happiness Well, I suppose I've had my share for one lifetime" For all this, there can be no life with greater opportunities for delight in work than medicine, and such of us as have felt this delight would not willingly deny it to others. But when we come to study the entry into medicine, we find that the amount of self-selection is extremely small According to Sir Alan Newton's questionnaire, for only 10 per cent had it been an ambition since childhood, whilst for over 50 per cent. it seems to have been a matter of complete indifference

It is high time, then, that some suitable body, such as the Royal Colleges, should organise an experiment on the value of methods of occupational selection in sifting the entry into medicine. It would be necessary to devise a psychological interview, and tests of physical aptitudes and of certain qualities of memory and intelligence A sufficient number of students would be submitted to the tests, and the findings would be correlated, say 7 and 15 years later, with teachers' reports, examination results and progress after qualification. And here, in passing, may I say how much organised medicine in this country owes to men who have been "good pickers" I think especially of Sir Robert Muir, who trained so many pathologists, and Sir Henry Dale, who selected such a remarkable band of workers for the Medical Research Council. Young men often do not know their own special gifts, and all of us have seen the serious, over-scrupulous person, who would have made a good researcher, trying to become a gynæcologist, and the person with ideas above his intellect enter the laboratory, when he would have been better working twelve hours a day as assistant to a shrewd practitioner. For such as these a kindly teacher may

do much, though it is often hard to find the right phrase and the right season

* * *

Within a few years we shall have to have a royal commission or its equivalent to decide the numbers entering the profession and the curriculum At present the General Medical Council has no control over the universities, and the universities have little control over the colleges at Oxford and Cambridge, or the hospitals in Edinburgh, Glasgow and London The Conjoint, the Triple Qualification and similar anomalies continue to exist, though I have never heard an argument for them that was not special pleading A London girl has much greater difficulty in getting into medicine than a girl in the provinces It is impossible to increase indefinitely the capacity of the existing schools, and if the numbers entering the profession remain large, new medical schools must be created From conversations with examiners and heads of units I believe that the best medical education available today is a preclinical course at Oxford plus a clinical course at Sheffield In both places classes of reasonable size are taught by teachers above the average in ability, but unless Oxford moves rapidly it will share the fate of Edinburgh and Cambridge and see its high reputation brought low by excessive numbers

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The curriculum includes 1 year premedical, 2 years preclinical and 3 years clinical work To this must be added 6 months of military service and sooner or later a compulsory 12 months in an approved hospital or laboratory before a licence to practise is granted Assuming the student starts this course at 17½ he cannot earn his living until he is 25 From this I conclude that it is impossible to increase the length of the medical course Since I qualified in 1923 enormous advances have been made in nutrition, chemotherapy, virus pathology, endocrinology, and radiology Our students cannot work more—already even the most intelligent have to study harder than is good for them The average chemist appears to be able to reason almost immediately after graduation, but it takes about 2 years before the young doctor recovers from the strain of qualifying and begins to think intelligently about the body of doctrine which has been handed on to him What is to be the solution of all this? How are we to adapt our curriculum to the growth of knowledge?

It is impossible for a medical man to look at the curriculum without prejudice, and when I look at it through the prejudiced eyes of a clinical scientist I am struck by the fact that we teach one subject twice over—the study of physical disease We teach it as pathology and we teach it again as the be all and the end all of diagnosis If we believe sincerely that prevention is better than cure, that 75 per cent of the sickness in our Western civilisations is without any anatomical basis, and that the work of the medical profession must be orientated towards the preservation and increase of health and the multiplication of a healthy stock, then it does seem as if both pathologist and clinical teacher are devoting an inordinate amount of time to the study of organic disease One of my teachers used to spend hours demonstrating the crescendo murmur of mitral stenosis with a bit of rubber tubing whilst another used to teach rarities of auscultation such as the veiled puff of Laennec Whether clinical teachers like it or not, their students are living in the days of the aeroplane, the wireless—and the laboratory, and the proper way for them to diagnose pulmonary tuberculosis is to suspect it on symptoms and to confirm it by X-ray and sputum tests On the other hand, the correlation between symptoms, signs and post-mortem appearances is being neglected since pathology has become an examination subject, with its special teachers, its particular jargon and its frequent scorn of the clinician In Oxford and Cambridge pathology is almost completely divorced from clinical studies

I suppose about 80 per cent of our students will become general practitioners and 80 per cent of their patients will come from homes with incomes less than £5 a week At lectures to medical societies and at postgraduate courses I have often heard practitioners say, "I wish I'd been taught more about children and skins," or "I don't think young men should go into practice knowing so little about the panel system and therapeutics" Never once have I heard a man say "It has always bothered me that I never really understood fatty change in the liver", or "We men in practice would handle our pneumonias a good deal better if we'd been taught a bit more about inflammation" The foundation stones of medical science are biology, chemistry, anatomy and physiology, and it would be a disaster to weaken them, but the superstructure must be modified to meet the needs of the time

Pathology developed because the practising clinician was unable to keep pace with the growth of knowledge in morbid anatomy and bacteriology The pupils of Muir and similar pioneers became pathologists throughout the length and breadth of the land, and being capable whole time workers they acquired strong influence in the medical schools and dominated the partition of the student's time The student who had already been well grounded in the fundamental sciences now had to be grounded afresh in pathology. This method of education was well adapted to its day, but its day is coming to an end When X, whose training had not followed the orthodox lines of the post mortem room and the demonstratorship in morbid anatomy, was appointed to a chair of pathology some years ago, the doyen of British pathologists was heard to murmur, "X? X? there is no pathologist called X" To which the obvious reply is, "Pathology? pathology? there is no science called pathology" America does today what we shall be doing tomorrow In America the status of academic pathology seems to be rapidly falling, and the bright young men go into applied physiology *or experimental medicine*

Bacteriology has become an *independent* science with close affiliations with chemistry, agriculture and hygiene Morbid anatomy is as well worked-out a field as clinical nosology *Whole time clinical units* have grown up in medicine, surgery and gynæcology which already cut their own *sections* and do their own routine bacteriology and pathological chemistry Disease as a *process*, and the end results of this process, should surely be taught as part of the clinical *sciences And so I think* that after being separate these thirty years pathology and medicine will fuse together again, and undergraduate teaching by professional pathologists will be limited to simple *courses in morbid* anatomy (part of surgery) and *clinical pathology* (part of medicine) Pharmacology will likewise be broken up between physiology *and medicine* The experimental pathologists and pharmacologists will work in research institutes and *postgraduate schools* a trend already clearly visible

Whatever our faults in medicine, we are at any rate conscious of many of them and anxious to improve Experience as head of a department, with

a certain amount of money to spend, suggests to me that in business efficiency is the exception rather than the rule, and I wonder, not that our people are losing markets, but that some of them retain any customers at all One or two of our manufacturers of standard physiological and laboratory equipment were notorious for delay even before rearmament gave them an excuse for casualness It is nothing to wait six months, without excuse or apology, for an order which should be executed within a week. An inquiry for balances, with a fair prospect of £50 worth of trade, produced a salesman who knew neither his catalogue nor the first principles of weighing; a cine-projector was demonstrated by another who had not taken the pains to familiarise himself with the controls A travel agency, in response to an inquiry about a trip to America, which was accompanied by fairly precise specifications as to date and route, merely sent shipping lists of which some were out of date and the others irrelevant. Is it any wonder that I contrast this unfavourably with certain famous German manufacturers of optical and microscopic apparatus, who always answer my queries in detail, make useful suggestions and are at pains to deliver promptly?

Much of our apparatus is fantastically costly. Of course there are far too many people making and selling medical apparatus—every hospital of any size seems to have its own firm across the road, and there is a regular constellation of them within a mile of Oxford Circus Mr Ogilvie has complained of the lack of individuality in American instruments, but the lack of standardisation in British instruments is an even greater fault—think of the number of times we have been let down because needles or lights are not interchangeable. The regional grouping of hospitals and the creation of a strong central committee, with the power of the purse behind it, should be especially valuable in standardising fittings and reducing prices We must reconcile ourselves to the fact that such committees will not always accept the doctor's opinion as gospel When he wishes his beds wired for electrocardiography, they may even have the temerity to suggest that it is cheaper and just as good to buy a portable instrument But some of our number have cried "Wolf" too often, and it will do no harm for someone to say "Oh yeah!" when we try to extort something quite unnecessarily extravagant and expensive on the grounds that it is essential for the welfare of the patient

On the other hand I should be glad to speak a kind word for the drug firms who are so often maligned for filling our waste-paper baskets with rubbish. It is true that they exploit human sickness and overcharge grievously, but which of us can throw the first stone at them on that account? They are nevertheless anxious not to put out preparations which do not do something of what is claimed, as this always does them harm in the end Their agents and travellers are becoming overwhelmingly old-school and guardee, but such as visit me do know their book The supply of materials to doctors who will carry out reasonable trials and report their results is exceedingly generous And how well-informed they are about the march of discovery! Already I have received offers of parenteral vitamin K

Moreover the advertisements are a great joy I have little use for the female forms which attract our attention to X-ray apparatus, cigarettes, ultra-short-wave therapy and the latest cure for *Trichomonas vaginalis*, but I am very fond of such as Borden's cows and Postum's "folk who make life a little tougher." I have begun, in a desultory way, to make up from them a Picture Book of Constipa... which may one day form the material for a le... and other collections of the same kind might ... interesting. Indeed, they might one day becom... valuable as the scrapbooks of the eighteenth centu... The reproductive functions, oral hygiene, breakf... foods, body odour—there is no dearth of subjects

* * *

Another thing that has caught my eye in t... journals is the Testament of Nutrition and t... doctors' somewhat unwarranted trespass into agricu... ture and its technique. The *Times's* page on agricu... ture is one of the high spots of my week, where ... follow with interest the progress of the Stap... grass technique and the quarrels between the ... and the cod-liver oil producers over the supplement... to the diet of the pig. This page has naturally ... some echoes of Indore and the great compost ... troversy. The fervour of the composters from ... suggested that they were speaking from the ... rather than the head, but it is only in the last ... months that I have realised that composting ... some has become almost a religion, and I am interested to find our Cheshire doctors amongst its disciples. I have been buttonholed on this subject at cock... parties when people have discovered I had a garde... and I have learnt that there is a something-sophi... society and a First Commandment—Give back t... the Earth what ye take from the Earth. I hope th... this will come to Freud's notice, for it will make a... interesting appendix to his views on the ætiology o... tidiness and miserliness, and their connexion with... the infant's preoccupation with its excretions

* * *

But I am finding that writing Grains and Scruples is just as fascinating as running a department or sitting on committees or playing about in the laboratory or talking to patients about their ego, and it is time I finished Moreover I have neglected my opportunity this week to moralise to the students, though that might have been difficult after betraying my particular blend of evangelism and hellenism, of St Anthony and Dionysus. But let them remember that doctors, like the priests, have often been hated by the people. They stood high on the list of victims in the blood-bath in Madrid It is wrong to rationalise this in terms of primitive hatred of the father, for the fault is in ourselves It is not given to mortal men to be the arbiters of life and death or to solve the riddles of the universe, and both we and the priests become stiff-necked in the rôle we are cast to play We must constantly remind ourselves of the danger of arrogance and cherish the virtue of humility

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Next month D P.M. will be responsible for these columns

" Especially does it seem incredible to us that the attributes of the human mind should be uniquely the property of a little organic slime on an infinitesimally small fragment of the matter in the universe Hence we postulate a greater mind, and wonder about it, as a couple of cells in the body might (were they suitably endowed) wonder whether they were part of something greater, without being able to reach a decision that was capable of demonstration I cannot bring myself to believe that the human mind is a purely ephemeral and essentially quite unimportant phenomenon in a vast inanimate universe "—Prof T D. A COCKERELL, of the University of Colorado, quoted in *Nature, Lond* Aug 19, 1939, p 304

THE LANCET

LONDON SATURDAY, AUGUST 26, 1939

DRASTIC REMEDIES

THE strenuous years of the curriculum proper are only a small part of our medical training, which starts at school and goes on through life, but it is these years that have come in for most criticism To read the medical journals one would think that they are organised very badly indeed, that is not so, but there are difficulties One is that, with the passing of the apprenticeship system, the student does not come into contact with patients until late in his career, another is that, with the advance of science, the years are increasingly overcrowded Of the first difficulty there is no efficient cure the student must work out his own salvation He cannot do it by playing golf or driving a motor-car, for these occupations take him away from the people to whom he must give his life Ninety per cent of the population come within the income-limit of the national health insurance acts These are the people he must know He must walk through the countryside and come to the hospital in a bus He may lunch off bread and cheese and beer at a country pub, or off coffee and poached eggs on the marble-topped tables of a teashop He must go regularly to the pictures and study the development of Shirley Temple and learn to recognise the "yee a ow" of Wendy Hiller when he hears it again at outpatients He should listen to the variety on the wireless, and hear the full-throated roar that greets the quip which has missed the censor Physiologists can teach him the theories of nutrition, housekeepers its practice On Friday evening he should go shopping with his landlady or her daughter, to learn the price of bacon and which are the cheaper cuts, to know the countries that send us butter and how much we have to pay for a pound from each Nor are these things all Music today is a necessity, and he must continue to read good English, and especially poetry, not only, as Lord HORDER has recently told us,[1] because the use of words is vital to the doctor but also that he may retain the flavour of a lovely language while he is studying from his textbooks

But if we ask the student to find his own solution to one of his difficulties our responsibility is the greater to solve the other Let us frankly admit that up to the present no way has been found In 1931 a start was made by London University, and a conference of examining and teaching bodies was appointed The conference began with the intention of lightening the curriculum, but in 1935 it produced a report of great ability which did nothing towards this, although it contained many valuable recommendations The time has come when some of us are *beginning to feel that* much more is required than a rearrangement of detail which will hurt nobody's feelings The ideal must be to look afresh at the objects to be attained and consider afresh the possible ways of reaching them From university and medical school incessantly comes the news that students are being over-worked and under educated Radical reform is essential, and it is a healthy sign that drastic remedies are now beginning to be proposed Last year, for example, Mr T B LAYTON, addressing the Society of Apothecaries, threw a bombshell, as we then described it,[2] when he suggested that the way to solve the difficulty is to take obstetrics out of the curriculum Recently he has returned to the subject[3] and expounded his views further They are based on the fact that of those who qualify only a bare majority now go into general practice, so that the curriculum should no longer be constructed to turn out family doctors Its aim should rather be to produce men and women who can branch out in any direction for which they have a natural bent or into which fate guides them Even in general practice not all do obstetrics Hence students are being burdened with facts that most of them will never need and cannot use in after life Obstetrics, he argues, should therefore be transferred from the curriculum to the postgraduate period His next step would be to interpolate between qualification and independent practice a "graduate" period of a year in which the newly qualified young doctor would, by law, be allowed to practise only under the guidance and supervision of a senior There is nothing new in this last idea except the name, *its germ is included* in the report of the curriculum conference

The views put forward this week in Grains and Scruples by Doctor Don differ from those of Mr Layton only as do the academic from the economic Doctor Don suggests that the time is at hand when the student will be unable to earn his living before the age of 25 Mr Layton proclaims that, whatever is done, there must be no further inroads on fathers' pockets Doctor Don would disestablish pathology and fuse it to medicine, and would split up pharmacology between physiology and medicine Mr Layton would translate obstetrics to a higher plane But if the curriculum is lightened in these or other ways we must be careful that it is not swamped by a number of other subjects simply because enormous advances are being made in them The new knowledge must be absorbed into the existing divisions of the student's time, which must each drop something to make room for it On this point Doctor Don writes wise words that should be taken to heart by clinicians and pathologists His suggestions and those of Mr Layton are drastic but they are both practical and practicable Medical educationists will give them the consideration they deserve, for, to quote Doctor Don, "Whatever our faults in medicine, we are at any rate conscious of many of them and anxious to improve"

[1] *Lancet* 1939 1 914

[2] *Ibid* 1938 2 1249

[3] *Guy's Hosp Gaz* July 15 and Aug 12 1939

CHOICE OF A CAREER

THE newly qualified doctor has before him a wide choice of careers. "Being a doctor" is by no means one profession, and too many young medical men slip into one or other of its branches without realising what the choice entails. It is very important that he should choose that career for which he is fitted by intelligence, aptitude, interest, and financial means. At the best a wrong choice at the outset may end in a re-start and wasted time, at the worst in the misapplication of a whole life. For this reason a young doctor should be careful not to enter on his life's work by taking the line of least resistance or by being led astray by mere names As an example of the former, many enter general practice simply because their fathers have a practice into which they can step, although they are by nature wholly unfitted for it. As an example of the fallacy of names, it is not unknown for idealists to enter the Public Service thinking that it will give them the best opportunities for public service, only to be terribly disillusioned.

Determinants

First with regard to intelligence. It must be realised at the outset that this is not the same thing as facility in passing examinations; the two may, and often do, go together, but there are plenty of first-class doctors who were always bad examinees but who do well because they possess common sense. It is a mistake to adopt from humility what one feels to be the simplest form of medical practice just because one does badly in examinations On the other hand, it would be rash to embark on a branch of medicine in which multiple degrees or diplomas are essential, such as consulting gynæcology, if examinations are always a difficulty.

Aptitude and interest usually, but not necessarily, go together. A man may be interested in administration and yet lack the organising faculty. The most energetic members of medical boards and committees are not always those whose activities are most useful. Interest should be the primary consideration. A doctor who chooses a branch of his profession simply to make money will certainly make a mistake If his real interest is in making money there are better ways of doing it. Medicine offers such a variety of interests that it should be put to a better use.

Financial means are correlative to interest. Private means are the greatest help in allowing the choice of whatever branch will ultimately bring the greatest satisfaction without any risk of anxiety in the meanwhile, but an intense desire to follow a particular bent can always be gratified by determination. Many highly specialised surgeons have had to work and stint themselves for years in order to achieve what they set out to do. One thing can, and should, be said: that the importance of earning a livelihood at once should never be allowed to weigh too heavily. It is a great temptation. The newly qualified man has passed through a long training, usually at considerable cost to others, and the thrill, to say nothing of the duty, of being at last self-supporting is a powerful incentive. And yet it should be allowed to count for practically nothing. The newly qualified doctor is qualified, but he is not a doctor. For many of his possible careers further experience and training are ...tial; for all of them they are an advantage.

...here are two things that every doctor should do ...st to achieve: a resident appointment in his ...school, and a locum tenency in general practice. All old teachers tell the same story—how they have constantly been told how much their old students regret in after life not having been a resident in their own hospital It is unfortunate, but natural, that for ever after, in judging a man's fitness for any post, it is felt that if he did not hold such an appointment it was, perhaps, because those who knew him best did not think he was good enough. And yet, time and again, young men throw away the opportunity for the sake of earning seven pounds a week instead of one. A post as locum tenens in a general practice, or in several general practices, is an invaluable experience, and can often be taken while waiting for the resident appointment. It does not matter what line is subsequently going to be chosen If general practice, then it is wise to make one's early mistakes (and there will be plenty of them) in someone else's practice. If consulting practice or a government post, nothing is more valuable than to *know*, at first hand, about general practice and general practitioners; and it teaches the arts of treatment and of dispensing in a way which even the perfect curriculum could not do

The possibility of travel should be considered, because this may be the last chance. Once embarked on a career, a doctor finds it very difficult to get away. At the outset there is time, and six months as a ship's surgeon, apart from present enjoyment, enlarges for life the outlook of one who might become much more parochial than he is apt to think likely. A few months of medical work on the Continent offer the additional advantage of learning a language thoroughly and of appreciating the outlook of one foreign nation, besides the stimulus of a Medicine which is bound to be in many ways very different. It is much less expensive than is usually supposed.

Many degrees do not necessarily make a good doctor, and the public is apt to judge as much by the number as by the nature of the letters, but it is becoming increasingly necessary, with the influx into the profession and the competiton for appointments, to hold such degrees and diplomas as will support an application on paper. For instance, the M.R C P. or the F R C.S. are usually compulsory qualifications for an applicant to a post on the staff of a large hospital, and the D.P H. is essential for advancement in the public services. Equally, a diploma in radiology, psychological medicine, child health, anæsthetics, tropical medicine, or clinical pathology is of the greatest value in its own special department, and the number of these special diplomas, as evidence of particular proficiency, is increasing. To a general practitioner none of them is essential but, as many general practitioners tend later to specialise in one branch of medicine or to take a part-time appointment in the public service, a higher qualification is often an advantage The decision is best taken early, because it is easier to pass examinations when young, and the opportunity for special study, even for writing an M D. thesis, does not come to a man engaged in a busy practice.

Independent Practice

Private practice, in one or other of its forms, offers the greatest possibilities of that variety of interest which comes from the combination of intimate human relationships and scientific work, and also the greatest financial rewards. The emoluments of medical practice in England are higher than on the Continent, and compare very favourably with those

of any profession in this country with the exception of the law The well educated doctor ranks high in society, he occupies much of the position, as adviser and friend, which was formerly held by the priest, and his long training in independent thought and action fits him to take his place as a leader in any community in which he works On the other hand, private practice demands hard work, tact, and forbearance, and often involves lean years of waiting before its rewards materialise Success depends on personal effort and initiative, and, although private practice will certainly provide a livelihood, it is the road to great fortune only for the few

GENERAL PRACTICE

General practice is the choice of the majority *It should not be thought that it is the last resort* into which a doctor goes because he is not good enough for anything else On the contrary, it demands the very best It is often truly remarked that any fool can become expert on a narrow specialty, but that it needs a first class man to be tolerably good at everything It is equally true that the tact in handling patients, which is necessary for consulting practice, is doubly necessary for general practice A consultant's dissatisfied patient goes away and is forgotten, a general practitioner's goes home and spreads dissatisfaction General practitioners fall into two main groups: the "Mayfair" practitioner in the heart of a large town, and the suburban or country doctor The social and financial rewards of the former are greater, so are the expenses and the risks The medical and human rewards of the latter are unsurpassed A preference for town or country life should be taken carefully into consideration

There are three ways of starting in general practice First, by "squatting," that is, putting up a plate and waiting for patients This involves least capital outlay, as it is only necessary to take a house, and, in a rapidly growing neighbourhood, is likely to be successful It tends, however, to lead to animosity and suspicion on the part of the other doctors in the district Secondly, by buying the goodwill of a practice on the retirement or death of its owner This usually costs from £1000 to £2000, and, although the money is easily borrowed, it will probably saddle a young man with a heavy debt for some years Thirdly, by joining a pre established partnership The purchase price of a share is much the same as the price of an independent practice, but partnership reduces overhead expenses, allows time for rest, holidays and study, and permits a certain degree of specialisation Much depends on the partners, a good partnership is perhaps the best of all medical careers, unpleasant partners may make it the worst

Some potential general practitioners are dissuaded by the prospect of the sleepless nights of midwifery It is possible to build up a practice without doing midwifery at all, but it takes longer and it cuts the doctor off in part from the confidence and friendship of his patients Similarly, some are suspicious of the work entailed by panel practice This is unnecessary Contract patients are, on the whole extraordinarily thoughtful of the convenience of their doctor and, if he wholeheartedly does his duty by them, are as intimately his patients and friends as those who pay fees It depends entirely on the doctor Most general practitioners (and some consultants) have a panel, and it is of value in providing a known and reliable annual income The practitioner receives on the average about £420 a year from panel patients

CONSULTING PRACTICE

A consulting practice cannot be bought and it cannot be entered by partnership To build up a practice it is almost essential to be on the visiting staff of a hospital, and preferably of one with a medical school This involves an aptitude for, and a pleasure in, teaching, and, as it is only possible to remain a first-class teacher by doing original research, a prospective consultant should be sure he possesses these aptitudes and interests That is why it is not the *best* doctors who should be consultants but those of a particular type It is possible, though much more difficult, to succeed as a consultant without a hospital appointment, but it is always at the risk of being regarded by colleagues as a "consultoid"

Consultants have, in the past, been specialists only in the sense that they have restricted their practice to one of the three main branches of the profession medicine, surgery, or gynæcology With the improved standard of general practice and the increase of specialising partnerships, the general consulting physician is being superseded, and specialisation in all directions is increasing, for better or worse, and it is impossible to draw a line between the consultant and the specialist The line between the general practitioner and the consultant is itself vague, since any doctor who sees a patient with a colleague is a consultant It is generally taken, however, that a consultant sees patients only on the recommendation of a general practitioner, and, although there is an increasing tendency for patients to go direct to a specialist of their own choice, it is really in the interests both of the public and of the profession that consultants should adhere rigidly to their proper function Success in consulting practice demands very hard work and years of waiting, and, unless the aspirant has private means, he must in addition to his medical work be prepared to do a great deal more to make ends meet The late Sir Raymond Crawfurd said that a young consultant is always an examination coach, a lodging house keeper, or a journalist's hack There is, moreover, great competition both in "Harley-street" and in the hospitals, and the expenses are almost as high for a very small practice as for a very large one It is often difficult for a young consultant to marry In the end, energy and determination are rewarded, and the final success, when it comes, is very great

The possibilities of consulting practice in provincial towns are increasing, both in connexion with the universities and their medical schools and as a development from general practice Many good general practitioners in the large towns specialise and act largely as consultants, but this movement is being offset by the increase in large partnerships in which the partners specialise, particularly in the direction of doing their own major surgery Although there are excellent openings for consultants in the provinces it is, in most branches, difficult for a man confining himself strictly to a specialty to make a living outside London Specialisms such as clinical pathology may combine a salaried post in a hospital with private practice and thus be easier at the outset Others, such as radiology, involve large capital outlay

OPENINGS ABROAD

Medical registration is reciprocally accepted between Britain and Italy, Japan and some of the Dominions The scope for practice abroad is limited, these foreign countries and the Dominions produce enough (and sometimes too many) doctors for their own needs Care must be taken to make sure that a

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Financial means are correlative to interest. Private means are the greatest help in allowing the choice of whatever branch will ultimately bring the greatest satisfaction without any risk of anxiety in the meanwhile, but an intense desire to follow a particular bent can always be gratified by determination. Many highly specialised surgeons have had to work and stint themselves for years in order to achieve what they set out to do. One thing can, and should, be said: that the importance of earning a livelihood at once should never be allowed to weigh too heavily. It is a great temptation. The newly qualified man has passed through a long training, usually at considerable cost to others, and the thrill, to say nothing of the duty, of being at last self-supporting is a powerful incentive. And yet it should be allowed to count for practically nothing The newly qualified doctor is qualified, but he is not a doctor. For many of his possible careers further experience and training are ...tial; for all of them they are an advantage. ...here are two things that every doctor should do best to achieve: a resident appointment in his ...school, and a locum tenency in general practice. All old teachers tell the same story—how they have constantly been told how much their old students regret in after life not having been a resident in their own hospital It is unfortunate, but natural, that for ever after, in judging a man's fitness for any post, it is felt that if he did not hold such an appointment it was, perhaps, because those who knew him best did not think he was good enough. And yet, time and again, young men throw away the opportunity for the sake of earning seven pounds a week instead of one A post as locum tenens in a general practice, or in several general practices, is an invaluable experience, and can often be taken while waiting for the resident appointment It does not matter what line is subsequently going to be chosen. If general practice, then it is wise to make one's early mistakes (and there will be plenty of them) in someone else's practice. If consulting practice or a government post, nothing is more valuable than to *know*, at first hand, about general practice and general practitioners; and it teaches the arts of treatment and of dispensing in a way which even the perfect curriculum could not do.

The possibility of travel should be considered, because this may be the last chance. Once embarked on a career, a doctor finds it very difficult to get away. At the outset there is time, and six months as a ship's surgeon, apart from present enjoyment, enlarges for life the outlook of one who might become much more parochial than he is apt to think likely. A few months of medical work on the Continent offer the additional advantage of learning a language thoroughly and of appreciating the outlook of one foreign nation, besides the stimulus of a Medicine which is bound to be in many ways very different. It is much less expensive than is usually supposed.

Many degrees do not necessarily make a good doctor, and the public is apt to judge as much by the number as by the nature of the letters, but it is becoming increasingly necessary, with the influx into the profession and the competition for appointments, to hold such degrees and diplomas as will support an application on paper. For instance, the M.R.C.P. or the F.R.C.S. are usually compulsory qualifications for an applicant to a post on the staff of a large hospital, and the D.P.H. is essential for advancement in the public services Equally, a diploma in radiology, psychological medicine, child health, anæsthetics, tropical medicine, or clinical pathology is of the greatest value in its own special department, and the number of these special diplomas, as evidence of particular proficiency, is increasing. To a general practitioner none of them is essential but, as many general practitioners tend later to specialise in one branch of medicine or to take a part-time appointment in the public service, a higher qualification is often an advantage The decision is best taken early, because it is easier to pass examinations when young, and the opportunity for special study, even for writing an M.D. thesis, does not come to a man engaged in a busy practice.

Independent Practice

Private practice, in one or other of its forms, offers the greatest possibilities of that variety of interest which comes from the combination of intimate human relationships and scientific work, and also the greatest financial rewards. The emoluments of medical practice in England are higher than on the Continent, and compare very favourably with those

of any profession in this country with the exception of the law The well educated doctor ranks high in society, he occupies much of the position, as adviser and friend, which was formerly held by the priest, and his long training in independent thought and action fits him to take his place as a leader in any community in which he works On the other hand, private practice demands hard work, tact, and forbearance, and often involves lean years of waiting before its rewards materialise Success depends on personal effort and initiative, and, although private practice will certainly provide a livelihood, it is the road to great fortune only for the few

GENERAL PRACTICE

General practice is the choice of the majority It should not be thought that it is the last resort into which a doctor goes because he is not good enough for anything else On the contrary, it demands the very best It is often truly remarked that any fool can become expert on a narrow specialty, but that it needs a first-class man to be tolerably good at everything It is equally true that the tact in handling patients, which is necessary for consulting practice, is doubly necessary for general practice A consultant's dissatisfied patient goes away and is forgotten, a general practitioner's goes home and spreads dissatisfaction General practitioners fall into two main groups the "Mayfair" practitioner in the heart of a large town, and the suburban or country doctor The social and financial rewards of the former are greater, so are the expenses and the risks The medical and human rewards of the latter are unsurpassed A preference for town or country life should be taken carefully into consideration

There are three ways of starting in general practice First, by "squatting," that is, putting up a plate and waiting for patients This involves least capital outlay, as it is only necessary to take a house, and, in a rapidly growing neighbourhood, is likely to be successful It tends, however, to lead to animosity and suspicion on the part of the other doctors in the district Secondly, by buying the goodwill of a practice on the retirement or death of its owner This usually costs from £1000 to £2000, and, although the money is easily borrowed, it will probably saddle a young man with a heavy debt for some years Thirdly, by joining a pre established partnership The purchase price of a share is much the same as the price of an independent practice, but partnership reduces overhead expenses, allows time for rest, holidays and study, and permits a certain degree of specialisation Much depends on the partners; a good partnership is perhaps the best of all medical careers, unpleasant partners may make it the worst

Some potential general practitioners are dissuaded by the prospect of the sleepless nights of midwifery It is possible to build up a practice without doing midwifery at all, but it takes longer and it cuts the doctor off in part from the confidence and friendship of his patients Similarly some are suspicious of the work entailed by panel practice This is unnecessary Contract patients are, on the whole, extraordinarily thoughtful of the convenience of their doctor and, if he wholeheartedly does his duty by them, are as intimately his patients and friends as those who pay fees It depends entirely on the doctor Most general practitioners (and some consultants) have a panel and it is of value in providing a known and reliable annual income The practitioner receives on the average about £420 a year from panel patients

CONSULTING PRACTICE

A consulting practice cannot be bought and it cannot be entered by partnership To build up a practice it is almost essential to be on the visiting staff of a hospital, and preferably of one with a medical school This involves an aptitude for, and a pleasure in, teaching, and, as it is only possible to remain a first-class teacher by doing original research, a prospective consultant should be sure he possesses these aptitudes and interests That is why it is not the *best* doctors who should be consultants but those of a particular type It is possible, though much more difficult, to succeed as a consultant without a hospital appointment, but it is always at the risk of being regarded by colleagues as a "consultoid"

Consultants have, in the past, been specialists only in the sense that they have restricted their practice to one of the three main branches of the profession medicine, surgery, or gynæcology With the improved standard of general practice and the increase of specialising partnerships, the general consulting physician is being superseded, and specialisation in all directions is increasing, for better or worse, and it is impossible to draw a line between the consultant and the specialist The line between the general practitioner and the consultant is itself vague, since any doctor who sees a patient with a colleague is a consultant It is generally taken, however, that a consultant sees patients only on the recommendation of a general practitioner, and, although there is an increasing tendency for patients to go direct to a specialist of their own choice, it is really in the interests both of the public and of the profession that consultants should adhere rigidly to their proper function Success in consulting practice demands very hard work and years of waiting, and, unless the aspirant has private means, he must in addition to his medical work be prepared to do a great deal more to make ends meet The late Sir Raymond Crawfurd said that a young consultant is always an examination coach, a lodging-house keeper, or a journalist's hack There is, moreover, great competition both in "Harley-street" and in the hospitals, and the expenses are almost as high for a very small practice as for a very large one It is often difficult for a young consultant to marry In the end, energy and determination are rewarded, and the final success, when it comes, is very great

The possibilities of consulting practice in provincial towns are increasing, both in connexion with the universities and their medical schools, and as a development from general practice. Many good general practitioners in the large towns specialise and act largely as consultants, but this movement is being offset by the increase in large partnerships in which the partners specialise, particularly in the direction of doing their own major surgery Although there are excellent openings for consultants in the provinces it is in most branches, difficult for a man confining himself strictly to a specialty to make a living outside London Specialisms such as clinical pathology may combine a salaried post in a hospital with private practice and thus be easier at the outset Others, such as radiology, involve large capital outlay

OPENINGS ABROAD

Medical registration is reciprocally accepted between Britain and Italy, Japan and some of the Dominions The scope for practice abroad is limited, these foreign countries and the Dominions produce enough (and sometimes too many) doctors for their own needs Care must be taken to make sure that a

qualification is adequate before deciding, especially in the case of Canada, where the registration laws are peculiar. In the rest of the Commonwealth a registered British qualification is sufficient. Private practice in any of the larger towns has much the same features as private practice at home Climatic conditions may be worse (the terrors of tropical climates have been grossly over-estimated) but the life appeals to many and the financial reward is considerable.

Public Services

Apart from the part-time appointments, such as consultant to the L C.C, which offers valuable additions of interest, experience, and salary, the public service is a very different career from private practice in its regular hours, a known salary and, in most cases, a pension. Promotion goes mainly by seniority and, provided he makes no serious mistake, a properly qualified man may be pretty certain that, once embarked on it, he will in due course find himself somewhere near the top of the tree On the other hand, individual effort, originality, and extra work may find less reward than they do in private practice

A great variety of occupations is included under the public service, from purely clinical to purely administrative, but it must be remembered that in most cases every promotion means less clinical and more administrative work, and the higher posts are chiefly administrative. It is therefore temperament which should lead a man to decide between public and private practice.

HOSPITAL APPOINTMENTS

Since the Local Government Act of 1929, a vast number of poor-law infirmaries, besides fever hospitals and mental hospitals, have passed under the control of the local authorities and have been greatly transformed. In London the County Council took over 76 hospitals and institutions, including 28 general hospitals. In many of the larger towns similar changes have taken place, and indeed Manchester has progressed a long step forward in setting up a Joint Hospitals Advisory Board to coördinate the voluntary and municipal hospitals in one scheme Medical appointments in London consist of whole-time hospital staffs and consultants The whole-time staffs are graded according to seniority and the size of the hospital, and range from house physicians and surgeons at £120 a year, through assistant medical officers starting at £350, senior assistants at about £600, deputy medical superintendents at about £700 to medical superintendents at a maximum of £1,650 The best appointments are, of course, few, and high qualifications, both medical and administrative, are required. Preference is given in all appointments to officers with the M.D. or M.R.C P or corresponding surgical qualifications.

Medical officers have considerable freedom, but those used to voluntary hospital standards are liable to feel their efforts stultified by the large number of patients they have to look after (the proportion is about 80 patients per medical officer as compared with about 10 in the voluntary hospitals) It is easy for anyone contemplating the service as a career to gain first-hand experience by taking a post as house physician or surgeon. If it proves uncongenial, nothing is lost, because these posts give valuable experience to any doctor In the L C C area living-in is no longer compulsory in the senior appointments, and allowances are made in lieu of board and lodging Ordinary leave and study-leave with pay are allowed. Some of the appointments take previous resident experience, and newly qualified men should be warned that the requirement may not arise for some years, when promotion may be found to be blocked by failure to have held a resident appointment earlier.

The mental and fever hospitals offer opportunities similar to those of the general hospitals. Prospective medical officers should bear in mind the need for the diploma of psychological medicine or public health in these two branches. A large number of part-time consultants are employed by the L C C. at a salary of £125 per annum for one session a week These posts are purely consultative to the staffs of the hospitals, but provide valuable clinical experience in addition to a fixed salary.

PUBLIC HEALTH

Medical officers of health are appointed to counties, county boroughs, boroughs, and urban and rural districts More than half of them are still part-time officers, combining their public office, for which they receive a salary, with a general practice, especially in the smaller and less populated districts, but the number of whole-time appointments is increasing, and they will in future be universal. It is unlikely that a new entrant into the public health service would be allowed private practice. For a full-time M O H the diploma of public health, sanitary service, or state medicine is obligatory, and it is very important that candidates should have had the experience of resident hospital appointments, particularly in special departments. The duties of a M.O.H. are to supervise the environmental, infectious diseases, maternity and child welfare, tuberculosis and venereal diseases services, and to advise the sanitary authority The school medical service is often (and increasingly) under his control, and he may have a considerable staff working under him. The salaries of assistant medical officers is from £500–£700, of senior medical officers from £750, and of M.O.H 's from £800–£2000 The highest paid posts are administrative; the salaries of clinical specialists seldom rise above £950 Provision is made for superannuation and for holidays with pay. There is security of tenure for the majority of posts About 120 medical officers are now employed directly by the Ministry of Health The public health service has, obviously, many attractions; its drawbacks are simply those inherent in lay, and it may be political, control Appointing authorities are more likely to be impressed by evidence of experience than by degrees or diplomas

School medical officers are appointed to perform, among other duties, the routine examination of school children In some areas they report to the local authority and recommend treatment, but do not treat; in others they are responsible for minor treatment. There is little variety in the work. Many specialists, in orthopædic and ear, nose and throat disease, for instance, are employed by the public health service Tuberculosis officers are experts in tuberculosis, who run the dispensaries and are responsible for organisation and diagnosis, and who recommend treatment In some cases they carry out treatment themselves. Venereal diseases officers are either whole- or part-time and are responsible for diagnosis and treatment in the clinics

DEFENCE SERVICES

The Royal Naval Medical Service, the Royal Army Medical Corps, and the Medical Branch of the Royal Air Force offer great attractions to those who are temperamentally suited for a life in the forces The pay and conditions are good and there is a prospect

of a pension sufficient to provide a comfortable livelihood or to form a very helpful supplement to the earnings from a small general practice There are now no entrance examinations but appointments are made after an interview Commissions are granted in the first place on a short term basis for three years, which may be extended to five After four years, officers have the opportunity to apply for transfer to the permanent list and just now they have an excellent chance of being accepted Those who leave the service after three or five years receive a gratuity of £400 or £1000 For those who stay on, promotion is automatic with steadily increasing pay for the first 16 years or so, by which time an officer should be earning about £1000 a year The commencing salaries are from £360 to £438 The scale throughout is not quite as high in the R A M C as in the other two services, but in all it is enough to allow a young officer to live without private means and to marry when he is about 30 For those who are accepted for the permanent list there is an excellent opportunity for learning and practising a specialty, which carries extra emoluments and may well be a source of income after retirement The usual retiring age is 55 and the average pension would then be about £500 a year A more detailed account of these services is given under their respective headings

INDIAN MEDICAL SERVICE

This is primarily a military service, but officers are eligible for 142 civil posts It offers a great variety of occupations, including many research appointments and posts on the staffs of teaching hospitals For the first class man it is probably the best of the services, for the average or second rate man, it would not be likely to be so suitable Candidates should be under 32 and are selected by the Secretary of State for India The rates of pay range from about £600 to £1800 per annum and pensions are similar to those in the other services With certain exceptions, officers are allowed private practice

COLONIAL MEDICAL SERVICE

Candidates should be under 35 and must obtain a certificate of physical fitness After admission they are given a course of instruction in tropical medicine which is paid for by the government Conditions of service and superannuation vary very greatly in different Colonies and careful inquiries should be made as to local conditions and the possibilities of private practice *Rates of pay are relatively* low, but this is offset by low costs of living and supplementary earnings from private practice where this is allowed. The life offers much more scope for adventure and varied professional experience than practice in this country and the possibilities of specialisation and research are increasing It is the career par excellence "for all who like a life of freedom, the open air, responsible work, and a feeling of individuality which life in a crowd can never give"

Other Salaried Posts

RESEARCH AND LABORATORY WORK

Research work on grants is either a preliminary to consulting practice or an academic post, and is rich in intellectual rewards, but relatively ill paid, and likely to attract only those with a vocation Full time posts as professors or readers combine a competence, with freedom from present anxiety and the prospect of a pension, with every opportunity for teaching and research, but these are exceptional posts for exceptional men

INDUSTRIAL APPOINTMENTS AT HOME AND ABROAD

A certain number of large commercial undertakings employ full time medical officers There are about 50 such posts in the country The duties consist of the prevention and treatment of industrial accidents, poisoning, and the like, the giving of advice to both management and worker, and "welfare" work in general The duties naturally vary enormously in the different concerns The salaries are similar to those of medical officers of health Besides full time officers, there is a much greater number of *part time posts, held by general practitioners*, at salaries up to as much as £1800 a year The functions of industrial medical officers have in the past overlapped with those of certifying factory surgeons ("examining surgeons" under the new Factory Act) and general practitioners, but their spheres of action are being delimited An interest in sociology is an important qualification for most of these posts, as the work should, at its best, be far more than narrowly medical, and in many ways psychology is as important as surgery

The Post Office Medical Service comes under the same general heading This is a very large organisation, providing free medical attention to many thousands of employees outside the National Health Insurance scheme Here again, besides the whole-time headquarters staff, about 1800 doctors are employed on a part-time basis

There are many opportunities in connexion with rubber and tea plantations, engineering works, mines, &c These posts are remunerative and full of interest, the work is largely preventive and malaria control is an important part of it The status of this branch of the profession is rapidly rising The Ross Institute in London is the meeting ground of the commercial and medical interests, to which inquiries for medical officers and applications for posts for the most part go. Most of the appointments are for a definite time, but open to renewal, and tenure is, in actual fact, secure They are not pensionable, but the rates of remuneration are proportionately higher (£1000–£3000 a year with many incidental allowances) Adequate leave is granted on full pay

Careers for Women

Women doctors can and do engage in almost every type of practice open to men There are now over 6000 medical women on the Register out of a total of some 60,000 An analysis made ten years ago by the Medical Women's Federation showed that at that time a thousand of its members were distributed as follows —

	per cent.
General practice	40 6
Hospital and institutional	12 7
Consulting and specialist	14·0
Research	3 6
Public health	15 6
Retired	9 0
Not ascertained	4 5

The number, status, and prosperity of women general practitioners and consultants are on the increase, and there are now women medical officers of health, professors, and school and industrial medical officers, and many women are employed abroad in the Colonial Service, the Women's Medical Service for India, the missionary services, and so on Though as a general rule honorary appointments at hospitals are not

open to women there are hospitals staffed entirely by women in London, Edinburgh, Glasgow, Manchester, Bristol, and Brighton

Women may still be handicapped in reaching the highest posts under local authorities. The L.C.C have now removed the illogical marriage bar which some authorities still exercise and the Civil Service Departments now have a "saving" clause that in certain circumstances resignation will not be enforced on marriage. There are some figures that suggest that women do as well or better in general practice than men, partly because the limitation of women students at the medical schools has the effect of raising the standard and of making women doctors on the average better educated than their male colleagues. The special aptitudes and interests of women give them particular advantages in school medical inspection, child welfare, and midwifery, which more than offset the prejudice that some members of the public still feel against them.

HIGHER QUALIFICATIONS

APART from university degrees already mentioned higher qualifications in medicine, surgery, and obstetrics are granted by various professional corporations.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

THE MEMBERSHIP AND FELLOWSHIP M.R.C.P. AND F.R.C.P.

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination

Membership.—The age for admission to this diploma, it will be noticed, has been changed from 25 to 23 years. The alteration in the by-law of the College is designed to enable men who have just finished house appointments to sit for an examination for which their recent clinical experience has exactly fitted them. The candidate must either have obtained the licence of the College, or a degree of doctor or bachelor of medicine at a university which is registrable by the General Medical Council and is recognised by the Censors Board. The examination is directed partly to pathology and partly to the practice of medicine Credit is also given to candidates who show a knowledge of French or German, and there is a definite small allotment of marks for these optional subjects in the total qualifying marks. Further information may be obtained from the registrar at the College.

Fellowship.—Fellows are selected annually from the ranks of members by the Council of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

THE FELLOWSHIP F.R.C.S.

The College confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Four Members of long standing may also be elected to the Fellowship annually. The bulk of the Fellows, however, obtain the diploma as the result of an examination. This is divided into two parts—viz., the primary examination and the final examination The subjects of the primary examination are anatomy and physiology and those of the final examination surgery, including surgical anatomy, and pathology. The examinations are partly written and partly viva voce, and include the examination of patients and the performance of operations on the dead body. The primary examination is held in June and December and the final in May and November.

Admission to the Primary Examination.—A member of the College is admissible to the primary examination at any time after receiving his diploma of membership. A candidate who is not a member is admissible after passing the first professional examinations of the English Conjoint Board in anatomy and physiology, or the equivalent examination in a recognised university, on the production of certificates of attendance upon prescribed courses.

Admission to the Final Examination.—For members of the College or graduates in medicine who passed the primary examination before Jan. 1st, 1935, the conditions of admission are as follows: (1) A member of the College is admissible to the final examination at any time after having passed the primary examination, on producing satisfactory evidence of having been engaged for not less than six years in the study (or study and practice) of the profession (2) A candidate who is not a member of the College, but who possesses a qualification recognised by the Council for the purpose, is admissible to the final examination, after having passed the primary examination, on the production of evidence of having been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance upon the surgical practice of a recognised hospital or infirmary

For all other candidates the conditions of admission are as follows: A candidate who has passed the primary examination and who is *either* (*a*) a member of the College who can produce satisfactory evidence of having been engaged in the study (or study and practice) of the profession for not less than six years, *or* (*b*) *a graduate of four years' standing* in medicine and surgery in a university recognised by the Council for the purpose, is admissible to the final examination on producing evidence that he has held for not less than six consecutive months the post of resident house surgeon, or other responsible post in charge of general surgical patients in the wards of a general hospital recognised by the Council for the purpose

Note.—In compliance with a condition of the Charter the Diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS

THE MEMBERSHIP AND FELLOWSHIP M.R.C.O.G AND F.R.C.O.G.

One of the principal objects of the College is to encourage the study and practice of obstetrics and gynæcology, subjects which should be inseparably interwoven. The College consists of fellows and members.

Candidates for the *Membership* must have been entered on the British Medical Register for at least three years or be eligible for entry thereon Before being accepted for the examination they must produce

evidence, satisfactory to the Examination Committee of having held resident hospital appointments in general medicine or surgery and in obstetrics and gynæcology for the period laid down in the regulations (at present six months each) Candidates who are accepted for examination must present records of 25 obstetrical and 10 gynæcological selected and personally attended cases and be prepared to discuss these in the examination, they must also present two commentaries on individual cases or groups of cases The examination consists of two written papers, a clinical examination, and a viva voce on pathology and case records

The *Fellowship* of the College is granted to those members who are judged to have advanced the science and art of obstetrics and gynæcology

The fellowship and membership of the College include practically every teacher of obstetrics and gynæcology in Great Britain and the British Dominions Fellowship or membership is now a necessary qualification for election to the staff of many obstetric and gynæcological hospitals and it is anticipated that in time it will be essential for election to the staff of all such hospitals, consequently all intending to specialise in obstetrics and gynæcology should endeavour to obtain the membership as soon as possible.

The regulations may be obtained from the hon secretary, Royal College of Obstetricians and Gynæcologists, 58, Queen Anne street, London, W 1

SOCIETY OF APOTHECARIES OF LONDON

MASTERY OF MIDWIFERY
M M S A

The examinations for this diploma are held in May and November Candidates will be admitted to the examination who have been registered practitioners for at least three years and who have held a resident appointment in an institution recognised by the Society for six months or more, and who for three months in each case have attended an antenatal clinic and an infant welfare centre, also recognised by the Society Medical officers employed by a public health authority, and having special duties connected with maternity and child welfare, will be admitted to the examination on production of evidence to that effect The examination will be conducted by written papers and by clinical and oral tests

Further information can be obtained from the registrar, Apothecaries Hall, Water lane, E C

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

THE MEMBERSHIP AND FELLOWSHIP
M R C P E AND F R C P E

Membership.—A candidate, who must be a licentiate of a British or Irish College of Physicians, or a graduate in medicine of a university, approved by the Council, and 24 years of age, is examined in medicine, therapeutics, and in any branch of the departments of medicine specially professed, such as general pathology, psychiatry, public health, obstetrics, gynæcology, diseases of children, tropical medicine, or medical jurisprudence.

Fellowship.—The Fellows are selected annually from the ranks of the Members by the Council of the College.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

THE FELLOWSHIP
F R C S E

The College grants a diploma of fellowship after examination to the holders of British surgical degrees or diplomas and the holders of recognised degrees of the Universities of Canada, Australia, New Zealand, and India Candidates must be 25 years of age and in practice for at least two years, and they must give three weeks' notice of their intention to appear for examination The examination is written and viva voce, and includes surgery and surgical anatomy, operative surgery, and clinical practice One optional subject must also be taken, the range of these specialisms covering nearly every branch of medicine Candidates are not allowed to appear more than three times at the examinations, unless by permission of the President's Council

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

THE FELLOWSHIP
F R F P S

The Royal Faculty of Physicians and Surgeons grants, after examination, a fellowship which is registrable by the General Medical Council as an additional qualification For the fellowship qua physician or the fellowship qua surgeon, the candidate must pass in medicine or surgery as the primary subject and an additional subject cognate with medicine or surgery respectively must also be taken at the same examination Candidates are required to be approved by the Council before admission to the examination Successful candidates are later balloted for election by the Faculty and if elected, are duly admitted qua physician or qua surgeon Examinations are held quarterly The regulations respecting the fellowship, together with the dates of the examinations, may be obtained on application to the secretary, Royal Faculty of Physicians and Surgeons, 242, St Vincent-street, Glasgow, C 2

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

THE MEMBERSHIP AND FELLOWSHIP
M R C P I AND F R C P I

Membership.—This is granted on the result of an examination, held in February, June, and November each year

Fellowship.—Fellows are elected by ballot An applicant must have been a Member of the College for at least one year and must have attained the age of 27 years

Further particulars can be obtained from the registrar of the College at 6, Kildare street, Dublin

ROYAL COLLEGE OF SURGEONS IN IR

THE FELLOWSHIP
F R C S I.

Candidates for the Fellowship shall make application to the president and council to be admitted to examination They are required to pass examinations—primary and final Candidates present themselves for the final examination after passing the primary examination they have complied with the necessary regulations The subjects for the primary

are (*a*) anatomy, including dissections; and (*b*) physiology and histology. The subjects for the final examination are surgery, including surgical anatomy and pathology. For admission to the final examination the candidate must have passed the primary examination, and must be a licentiate or graduate in surgery of a university or licensing body recognised by the General Medical Council; candidates must be not less than 25 years of age.

Further particulars can be obtained from the registrar of the College, Stephen's Green West, Dublin.

SPECIAL DIPLOMAS

PUBLIC HEALTH

A diploma in public health (D.P H.) is granted by most of the British universities and by the English, Scottish, and Irish Conjoint Boards The courses of study are on the same general lines in all the centres since they are governed by rules laid down by the General Medical Council. These rules are as follows:

(1) A period of not less than two years shall elapse between the attainment by a candidate of a qualification in medicine, surgery, and midwifery and the grant of a diploma or degree in sanitary science, public health or state medicine

(2) The curriculum for a diploma or degree in sanitary science, public health or state medicine shall extend over a period of not less than (*a*) twelve calendar months of which not less than three consecutive calendar months shall be devoted to the whole-time study of the subjects comprised in Rule 3, or (*b*) an academic year of whole-time study covering a period of not less than nine calendar months, subsequent to the attainment of a medical qualification.

(3) Every candidate shall attend a course lasting not less than 280 hours at an institution approved by the licensing body granting the diploma or degree, during which he shall have received theoretical and practical instruction in (*a*) bacteriology and parasitology (including immunology, serology, and medical entomology), in relation to the public health; (*b*) the application of the principles of physiology and biochemistry to environmental and personal hygiene and to the public health; (*c*) the application of the principles of chemistry and physics to environmental and personal hygiene and to the public health.

(4) Every candidate shall attend a course lasting not less than 160 hours at an approved institution during which he shall have received instruction in . (*a*) the principles of hygiene, sanitation, and public health; (*b*) epidemiology and vital statistics (including statistical method); (*c*) public health law and administration; (*d*) industrial hygiene and the welfare of industrial workers; (*e*) house planning and sanitary construction; (*f*) the principles of genetics; (*g*) mental hygiene.

(5) Every candidate shall attend for three months on the clinical practice of an approved hospital for infectious diseases.

(6) Every candidate shall produce evidence that he has, during a period of not less than six months, been engaged in acquiring a practical knowledge of the duties, routine and special, of public health administration under the supervision of a medical officer of health

(7) The examination for the Diploma or Degree shall be divided into two parts, Part I and Part II.

A candidate must pass Part I before being admitted to examination for Part II, and in both parts a candidate must pass in all the specified subjects at one time

(8) Part I shall include written and oral examinations in the subjects comprised in Rule 3, together with a practical laboratory examination in the subjects specified in Rule 3 (*a*)

(9) The examination for Part II shall include the subjects referred to in Rules 4, 5, and 6 The examination shall be written and oral, and shall include clinical examinations in infectious diseases, and practical examinations in food inspection and inspection of premises, including dwellings, factories, workshops, and schools

PSYCHOLOGICAL MEDICINE

The Universities of London, Durham, Leeds, Manchester, Edinburgh, Dublin (Trinity College), Ireland (National University), and the English and Irish Conjoint Boards grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses.

University of London

Candidates for the D.P.M. must hold a registrable qualification and must either have held a resident or whole-time appointment at an approved institution for mental diseases for six months, or have attended the practice of such an institution for 12 months before taking part B of the examination. The examination is held twice a year and consists of two parts. Part A includes the anatomy, histology, and physiology of the nervous system and psychology; part B neurology and psychological medicine Candidates are examined in both mental diseases and mental deficiency and are required to give evidence of a higher knowledge in one or other of these branches.

University of Durham

The university grants a diploma in psychiatry (D Psy), and the medical school, King's College, Newcastle-upon-Tyne, includes a department of instruction in psychological medicine. The candidate must be a registered medical practitioner, and subsequent to qualification have received instruction in anatomy and physiology of the brain and nervous system The examination is divided into two parts, Part I dealing with anatomy, physiology, pathology, and bacteriology; Part II with psychology and experimental psychology, neurology and psychiatry. Candidates may present themselves for the whole examination or for either part separately. The course of training is very detailed, post-mortem technique being the subject of a series of sessions.

University of Leeds

The university grants a diploma in psychologica medicine to graduates in medicine of at least one year's standing who have received systematic instruction on the normal and morbid anatomy of the brain, and have held an appointment in a mental hospital. The examination is divided into three parts: Part I deals with general psychology and the structural development and physiology of the nervous system; Part II with the pathology of that system; and Part III with clinical psychiatry, the administration of mental hospitals, and the medico-legal aspects of insanity. Candidates may present themselves for the three parts simultaneously or separately; they may submit a thesis or published work which, if approved, will gain certain exemptions

University of Manchester

The university grants a diploma in psychological medicine to graduates of at least one year's standing The examination is held in two parts. Before presenting themselves for Part I candidates must,

subsequent to qualification, have attended approved courses in the structure of the nervous system and in experimental psychology Before presenting themselves for Part II they must produce evidence of having gone through an approved course of instruction in the pathology of the nervous system and in clinical neurology, and of having attended demonstrations in psychological medicine, and received clinical instruction, either as residents or, in approved cases, as daily attendants, at an approved hospital for mental diseases The course extends over a period of three university terms, two of which must be taken in the university, and candidates may present themselves for both parts simultaneously or for each separately

University of Edinburgh

The course for the D P M extends over one term and is given from January to March Candidates are required subsequent to the date of graduation or obtaining a recognised qualification to have held (*a*) a resident appointment for one year in a hospital for mental disorders approved by the faculty of medicine, or alternatively (*b*) a six months' appointment as defined in (*a*) and six months' practical study of nervous diseases in a special or general hospital approved by the faculty There are two examinations for the diploma, both of which are held in March Part I comprises anatomy and physiology of the nervous system, psychology Part II comprises neuropathology, psychiatry and clinical psychiatry, clinical neurology Candidates who have held an asylum appointment for a period of five years or more may be exempted from the course of study in one or more subjects of the curriculum Alteration of certain sections of the regulations is at present under consideration Full particulars can be obtained from the dean of the faculty of medicine

University of Dublin (Trinity College)

The D P M is conferred upon registered medical practitioners who have held a resident medical appointment at a recognised institution for the treatment of mental diseases for 12 months, or who have held such an appointment for six months and have attended clinical instruction at an approved institution for six months Candidates must also attend special courses of instruction and pass a special examination Details can be obtained from the registrar of the school of physic, Trinity College, Dublin

National University of Ireland

The D P M may be conferred on registered medical practitioners who, although they may not have matriculated at the University, have completed the prescribed course of study A certificate of post graduate work will be required from the candidates, either in the study of mental disease or as medical assistant in an asylum Application [illegible] be made to the registrars of the constituent coll University College, Dublin, University College, C and University College, Galway, for all inf[illegible]

English and Irish Conjoint Boards

Candidates for the diploma granted by t[illegible] must pass two examinations Part I (*a*) anatomy and physiology of the (*b*) psychology Part II consists including clinical and patholc (*b*) psychological medicine, inc tionship Further information be obtained from the secretary management

RADIOLOGY

Faculty of Radiologists

The fellowship of the Faculty (F F R) is intended to meet the need for a higher radiological qualification and is obtainable by examination and submission of a thesis Candidates must be eligible for membership of the Faculty (i e, have practised radiology, or radiology and electrotherapeutics exclusively for at least three years), registered medical practitioners of at least five years' standing, and radiological diplomates of at least two years' standing After 1940 candidates will also be required to have spent at least a year in general clinical work at approved hospitals

The examination is held annually in London at the beginning of December The candidate must pass an examination on an honours standard in radio-diagnosis and/or radiotherapy, and on a pass standard in general medicine, general surgery and pathology, with special reference to diseases in which radiology is concerned A thesis on some special subdivision of the candidate's radiological subject is also required, and can be presented either before or after taking the examination

Candidates need not necessarily be members of the Faculty in order to sit for the fellowship examination, but an approved candidate must be elected as such before he can be admitted a fellow The examination fee is 10 guineas, and the fellowship fee for successful candidates 20 guineas

Further particulars may be obtained from the warden, Faculty of Radiologists, 32, Welbeck-street, London, W 1

University of Cambridge

The teaching for this has hitherto been partly in Cambridge and partly in London, but it is likely that no further teaching will be undertaken in Cambridge and that the granting of the D M.R E will cease in 1941 The course begins in October and lasts nine months The first four months are occupied with (*a*) lectures and practical work in physics, in preparation for the examination for Part I in February, (*b*) an introductory course of clinical instruction in radiology and electrology, (*c*) a course of instruction in pathology in relation to radiology and electrology The next three months are occupied with (*a*) lectures and demonstrations in radiology and electrology (including radium therapy) organised by the British Institute of Radiology, (*b*) clinical instruction in the radiological department of a hospital approved by the committee During the final two months of the course a candidate must hold a clinical clerkship or similar appointment in the radiological department of a hospital [illegible] the committee This part of [illegible]e in London, or elsewhere [illegible] Part II is held in July [illegible]rticulars as to courses and [illegible] from the secretary

are (*a*) anatomy, including dissections; and (*b*) physiology and histology. The subjects for the final examination are surgery, including surgical anatomy and pathology. For admission to the final examination the candidate must have passed the primary examination, and must be a licentiate or graduate in surgery of a university or licensing body recognised by the General Medical Council, candidates must be not less than 25 years of age.

Further particulars can be obtained from the registrar of the College, Stephen's Green West, Dublin.

SPECIAL DIPLOMAS

PUBLIC HEALTH

A diploma in public health (D P.H) is granted by most of the British universities and by the English, Scottish, and Irish Conjoint Boards. The courses of study are on the same general lines in all the centres since they are governed by rules laid down by the General Medical Council. These rules are as follows:

(1) A period of not less than two years shall elapse between the attainment by a candidate of a qualification in medicine, surgery, and midwifery and the grant of a diploma or degree in sanitary science, public health or state medicine

(2) The curriculum for a diploma or degree in sanitary science, public health or state medicine shall extend over a period of not less than (*a*) twelve calendar months of which not less than three consecutive calendar months shall be devoted to the whole-time study of the subjects comprised in Rule 3, or (*b*) an academic year of whole-time study covering a period of not less than nine calendar months, subsequent to the attainment of a medical qualification.

(3) Every candidate shall attend a course lasting not less than 280 hours at an institution approved by the licensing body granting the diploma or degree, during which he shall have received theoretical and practical instruction in (*a*) bacteriology and parasitology (including immunology, serology, and medical entomology), in relation to the public health; (*b*) the application of the principles of physiology and biochemistry to environmental and personal hygiene and to the public health; (*c*) the application of the principles of chemistry and physics to environmental and personal hygiene and to the public health.

(4) Every candidate shall attend a course lasting not less than 160 hours at an approved institution during which he shall have received instruction in: (*a*) the principles of hygiene, sanitation, and public health; (*b*) epidemiology and vital statistics (including statistical method); (*c*) public health law and administration; (*d*) industrial hygiene and the welfare of industrial workers; (*e*) house planning and sanitary construction; (*f*) the principles of genetics; (*g*) mental hygiene.

(5) Every candidate shall attend for three months on the clinical practice of an approved hospital for infectious diseases

(6) Every candidate shall produce evidence that he has, during a period of not less than six months, been engaged in acquiring a practical knowledge of the duties, routine and special, of public health administration under the supervision of a medical officer of health.

(7) The examination for the Diploma or Degree shall be divided into two parts, Part I and Part II.

A candidate must pass Part I before being admitted to examination for Part II, and in both parts a candidate must pass in all the specified subjects at one time

(8) Part I shall include written and oral examinations in the subjects comprised in Rule 3, together with a practical laboratory examination in the subjects specified in Rule 3 (*a*)

(9) The examination for Part II shall include the subjects referred to in Rules 4, 5, and 6 The examination shall be written and oral, and shall include clinical examinations in infectious diseases, and practical examination in food inspection and inspection of premises, including dwellings, factories, workshops, and schools

PSYCHOLOGICAL MEDICINE

The Universities of London, Durham, Leeds, Manchester, Edinburgh, Dublin (Trinity College), Ireland (National University), and the English and Irish Conjoint Boards grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses.

University of London

Candidates for the D P M must hold a registrable qualification and must either have held a resident or whole-time appointment at an approved institution for mental diseases for six months, or have attended the practice of such an institution for 12 months before taking part B of the examination. The examination is held twice a year and consists of two parts. Part A includes the anatomy, histology, and physiology of the nervous system and psychology; part B neurology and psychological medicine Candidates are examined in both mental diseases and mental deficiency and are required to give evidence of a higher knowledge in one or other of these branches.

University of Durham

The university grants a diploma in psychiatry (D Psy), and the medical school, King's College, Newcastle-upon-Tyne, includes a department of instruction in psychological medicine. The candidate must be a registered medical practitioner, and subsequent to qualification have received instruction in anatomy and physiology of the brain and nervous system. The examination is divided into two parts, Part I dealing with anatomy, physiology, pathology, and bacteriology; Part II with psychology and experimental psychology, neurology and psychiatry. Candidates may present themselves for the whole examination or for either part separately. The course of training is very detailed, post-mortem technique being the subject of a series of sessions.

University of Leeds

The university grants a diploma in psychological medicine to graduates in medicine of at least one year's standing who have received systematic instruction on the normal and morbid anatomy of the brain, and have held an appointment in a mental hospital. The examination is divided into three parts: Part I deals with general psychology and the structural development and physiology of the nervous system; Part II with the pathology of that system; and Part III with clinical psychiatry, the administration of mental hospitals, and the medico-legal aspects of insanity. Candidates may present themselves for the three parts simultaneously or separately; they may submit a thesis or published work which, if approved, will gain certain exemptions

University of Manchester

The university grants a diploma in psychological medicine to graduates of at least one year's standing The examination is held in two parts. Before presenting themselves for Part I candidates must,

subsequent to qualification, have attended approved courses in the structure of the nervous system and in experimental psychology Before presenting themselves for Part II they must produce evidence of having gone through an approved course of instruction in the pathology of the nervous system and in clinical neurology, and of having attended demonstrations in psychological medicine, and received clinical instruction, either as residents or, in approved cases, as daily attendants, at an approved hospital for mental diseases The course extends over a period of three university terms, two of which must be taken in the university, and candidates may present themselves for both parts simultaneously or for each separately

University of Edinburgh

The course for the D P M extends over one term and is given from January to March Candidates are required subsequent to the date of graduation or obtaining a recognised qualification to have held (*a*) a resident appointment for one year in a hospital for mental disorders approved by the faculty of medicine, or alternatively (*b*) a six months appointment as defined in (*a*) and six months practical study of nervous diseases in a special or general hospital approved by the faculty There are two examinations for the diploma, both of which are held in March Part I comprises anatomy and physiology of the nervous system, psychology Part II comprises neuropathology, psychiatry and clinical psychiatry, clinical neurology Candidates who have held an asylum appointment for a period of five years or more may be exempted from the course of study in one or more subjects of the curriculum Alteration of certain sections of the regulations is at present under consideration Full particulars can be obtained from the dean of the faculty of medicine

University of Dublin (Trinity College)

The D P M is conferred upon registered medical practitioners who have held a resident medical appointment at a recognised institution for the treatment of mental diseases for 12 months, or who have held such an appointment for six months and have attended clinical instruction at an approved institution for six months Candidates must also attend special courses of instruction and pass a special examination Details can be obtained from the registrar of the school of physic, Trinity College, Dublin

National University of Ireland

The D P M may be conferred on registered medical practitioners who, although they may not have matriculated at the University, have completed the prescribed course of study A certificate of post graduate work will be required from the candidates, either in the study of mental disease or as medical assistant in an asylum Application should be made to the registrars of the constituent colleges, University College, Dublin, University College, Cork, and University College, Galway, for all information

English and Irish Conjoint Boards

Candidates for the diploma granted by these Boards must pass two examinations Part I consists of (*a*) anatomy and physiology of the nervous system, (*b*) psychology Part II consists of (*a*) neurology, including clinical and pathological neurology, (*b*) psychological medicine, including its legal relationship Further information in either case can be obtained from the secretary of the committee of management

RADIOLOGY

Faculty of Radiologists

The fellowship of the Faculty (F F R) is intended to meet the need for a higher radiological qualification and is obtainable by examination and submission of a thesis Candidates must be eligible for membership of the Faculty (i e, have practised radiology, or radiology and electrotherapeutics exclusively for at least three years), registered medical practitioners of at least five years' standing, and radiological diplomates of at least two years' standing After 1940 candidates will also be required to have spent at least a year in general clinical work at approved hospitals

The examination is held annually in London at the beginning of December The candidate must pass an examination on an honours standard in radio-diagnosis and/or radiotherapy, and on a pass standard in general medicine, general surgery and pathology, with special reference to diseases in which radiology is concerned A thesis on some special subdivision of the candidate's radiological subject is also required, and can be presented either before or after taking the examination

Candidates need not necessarily be members of the Faculty in order to sit for the fellowship examination, but an approved candidate must be elected as such before he can be admitted a fellow The examination fee is 10 guineas, and the fellowship fee for successful candidates 20 guineas

Further particulars may be obtained from the warden, Faculty of Radiologists, 32, Welbeck street, London, W 1

University of Cambridge

The teaching for this has hitherto been partly in Cambridge and partly in London, but it is likely that no further teaching will be undertaken in Cambridge and that the granting of the D M R L will cease in 1941 The course begins in October and lasts nine months The first four months are occupied with (*a*) lectures and practical work in physics, in preparation for the examination for Part I in February, (*b*) an introductory course of clinical instruction in radiology and electrology, (*c*) a course of instruction in pathology in relation to radiology and electrology The next three months are occupied with (*a*) lectures and demonstrations in radiology and electrology (including radium therapy) organised by the British Institute of Radiology, (*b*) clinical instruction in the radiological department of a hospital approved by the committee During the final two months of the course a candidate must hold a clinical clerkship or similar appointment in the radiological department of a hospital approved by the committee This part of the course may be done in London, or elsewhere The examination for Part II is held in July and October Further particulars as to courses and examinations may be obtained from the secretary for the diploma, Cavendish Laboratory, Cambridge

University of London

The course for the diploma extends over one academic year and is open to registered medical practitioners and graduates in medicine of this or any other approved University The subjects are Part I, physics and electrotechnology Part II (*a*) radiology and radio diagnosis, (*b*) radiotherapy. The examination is held in March and June (Part I), and in July and December (Part II) Particulars may be obtained from the academic registrar,

University of Liverpool

Candidates must possess a registrable qualification approved by the University in medicine and surgery, and must have attended courses of instruction in (*a*) physics (two terms), (*b*) (i) radiology, and (ii) electrology during nine months in the X ray and electrotherapeutic department of a hospital or hospitals. An examination is held in March and June (physics) and in June (radiology and electrology) Examination in either part may be taken separately. The courses commence during the first week in October. Application should be made to the dean, faculty of medicine, the University of Liverpool.

University of Edinburgh

The course of study for the D M.R covers an academic year (nine months) and commences in October. The number of candidates to be admitted to the course is limited, and early application for admission is essential. Candidates are not admitted to the examination for the diploma until after the lapse of not less than one year from obtaining a recognised qualification The examination, which is written, oral, and practical, is in two parts: (*a*) physics, and (*b*) radiology Full particulars may be obtained from the dean of the faculty of medicine.

English Conjoint Board

The examination for the D.M.R., R C.P. and S. comprises Part I, physics as applied to radiology and Part II, medical radiology, with special reference to its clinical application, including radio-diagnosis, X ray therapy, and radium therapy. Both examinations, which are written, oral, and practical, are held during January and July The course extends over one academic year of full-time study, subsequent to the attainment of a recognised qualification Before admission to Part I the candidate must have attended a course of instruction in physics as applied to radiology at a recognised medical school or institution for not less than three months Before admission to Part II he must have attended at a recognised hospital courses of instruction, theoretical and practical, in medical radiology, including radio-diagnosis, X ray therapy, and radium therapy, with clinical experience for three terms.

Candidates may enter for Parts I and II either together or separately, but no candidate is permitted to proceed to Part II until he has passed in Part I. The conditions regarding admission to examination may be modified in the case of a candidate (*a*) who has carried out original investigations in any subject of the examination, or (*b*) whose studies have extended over a prolonged period of time without fulfilling the exact conditions. Exemption will not be granted from any part of the examination.

TROPICAL MEDICINE

There are six main types of medical service in the tropics: the Indian Medical Service, the Colonial Medical Service, research under the Medical Research Council, independent private practice, subsidised private practice, and medical service with big commercial and industrial corporations A diploma in tropical medicine is regarded as almost indispensable for these appointments. Systematic instruction for such a diploma is given in the University of Edinburgh, at the Liverpool School of Tropical Medicine, and at the London School of Hygiene and Tropical Medicine, while the Universities of Edinburgh and Liverpool and the English Conjoint Board grant diplomas.

University of Liverpool

The Liverpool University diploma of tropical medicine (D.T.M.) is open only to those who possess a qualification to practise medicine recognised by the university, and who have been through a full course of instruction at the Liverpool School of Tropical Medicine. The subjects of examination are (*a*) tropical medicine and pathology; (*b*) bacteriology; (*c*) parasitology; and (*d*) entomology. The course consists entirely of practical and clinical work, given at the laboratory at the university, and at a recognised hospital in which beds are specially reserved for tropical diseases. Applications should be made to the dean of the medical faculty, University of Liverpool

The university also grants a diploma in tropical hygiene (D.T H) The subjects of examination are (*a*) tropical hygiene; (*b*) practical sanitation; (*c*) applied entomology, (*d*) sanitary engineering, (*e*) vital statistics and epidemiology; (*f*) meteorology and climatology, and (*g*) chemistry Accommodation for research work is to be had at the university laboratory.

University of Edinburgh

The course of instruction is given during the autumn and spring terms, October to March, and includes tropical hygiene, bacteriology, entomology, and parasitology, diseases of tropical climates (systematic and clinical), tuberculosis, and venereal diseases Provision is made in the University for instruction in all subjects. The examinations are written, oral, and practical, and are held at the end of the courses. Part I in December, and Part II in March. The University is included in the list of institutions in which courses of instruction in tropical medicine may be taken by officers on appointment to the Colonial Medical Services or during study-leave. Full particulars can be obtained from the dean of the faculty of medicine.

English Conjoint Board

The Board conducts an examination three times a year for the D T M. and H. granted by the Royal Colleges—namely, in February, July and October

The examination is written, oral, and practical, as follows:—

(*a*) Protozoology, helminthology, and bacteriology (including spirochætes), together with their associated pathology and entomology in relation to the ætiology, diagnosis, and prevention of tropical diseases, (*b*) examination of tissues, blood, and excretions for evidence of parasitic infection in relation to tropical diseases; (*c*) medicine and surgery and clinical pathology in relation to tropical diseases, (*d*) the special application of hygiene and sanitation to tropical conditions, international conventions relating to public health, administrative measures in relation to the prevention and control of diseases occurring in the tropics, the epidemiology of tropical diseases, vital statistics, and personal hygiene in the tropics

The examination is open to candidates possessing *either* a qualification in medicine, surgery, and midwifery which is registrable in the British Medical Register, *or* the medical and surgical degrees of an Indian, Colonial, or Foreign University recognised by the Examining Board in England.

The course of study extends over five months. The committee of management may modify the conditions of the regulations with regard to admission to the examination in the case of candidates (*a*) who have been engaged in medical work in tropical countries; (*b*) who produce evidence of having been engaged in original investigations in tropical medicine

or hygiene No exemption is granted from any subject of the examination Copies of the regulations and further particulars may be obtained, free of charge, from the Secretary, Examination Hall, Queen square, London, W C 1

GYNÆCOLOGY AND OBSTETRICS

Royal College of Obstetricians and Gynæcologists

For those practitioners who have had special post-graduate experience in obstetrics, but whose experience and work do not allow of their admission to the membership, the College grants a diploma (D R C O G) Candidates for it must be entered on the British Medical Register They must produce evidence of resident post graduate experience in obstetrics as well as in general medicine or surgery Evidence of having regularly attended at antenatal, postnatal, and infant welfare clinics, and of a satisfactory course in gynæcology are also required The D R C O G is intended to indicate that the holder is a competent obstetrician and one who may be regarded as sufficiently capable to act in the capacity of consultant to local authorities in midwifery practice The examination does not, however, include gynæcology except in so far as it is directly associated with childbearing and this diploma is not meant for those who aspire to hospital appointments with charge of gynæcological beds

University of Dublin

Candidates for the D G O must ordinarily hold a registrable qualification, those not so qualified must apply to the committee of the School of Physic for special permission to attend the course The course lasts nine months and consists of six months' study at Trinity College and six months' residence at the Rotunda Hospital usually done concurrently, followed by three months' study either at the Rotunda or at some other approved institution Practitioners who have been practising obstetrics and gynæcology for five years will be excused the final three months' hospital work The course at Trinity College is begun in October, or, in exceptional circumstances, in January or April The course at the Rotunda can be begun at any time The total instructional and examination fees amount to £60

OPHTHALMOLOGY

Special diplomas in ophthalmology are issued by two examining bodies

University of Oxford

The diploma in ophthalmology (D O) is granted to registered medical practitioners, and to non registrable graduates of universities approved by the board of the faculty of medicine, after they have passed an examination which is held annually in June This examination is open to candidates who have attended a special two months' course of instruction at Oxford, and who have in addition done a ten months' course of clinical ophthalmology at a recognised hospital, making at least twelve months in all Entries for the course should be made through the dean of the medical school the museum, Oxford from whom any further information may be obtained

English Conjoint Board

The Conjoint Board grants the D O M S after an examination held in two parts, twice yearly, in February and July Part I comprises anatomy and embryology of the visual apparatus, physiology of vision, and elementary optics Part II comprises optical defects, ophthalmic medicine and surgery, and pathology with special reference to ophthalmology The examination in each case is written, oral, and practical or clinical Candidates may only enter for Part II on completion of a year of special study of ophthalmology after obtaining a recognised qualification

LARYNGOLOGY AND OTOLOGY

English Conjoint Board

The Board grants the D L O after an examination held in two parts, in June and December Part I comprises anatomy, embryology, and physiology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus Part II comprises the medicine, surgery, and pathology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus, and the recognition and use of special instruments and appliances The examination in each case is written, oral, and practical or clinical Candidates may only enter for Part II on completion of one year of special study of the diseases of the ear, nose, pharynx, and larynx after obtaining a registrable qualification, or a degree in medicine and surgery of a university recognised by the Board

ANÆSTHETICS

English Conjoint Board

Examinations for the D A take place twice yearly, in May and November Subjects include history, theory, and practice of anæsthetics, pharmacology and elementary chemistry of anæsthetic drugs, pre- and post operative conditions relevant to anæsthesia A candidate must either have held a resident appointment in a recognised general hospital for twelve months, of which six shall have been as resident anæsthetist and six as house physician or house surgeon in the general wards, or he must have administered anæsthetics in a recognised general hospital on not less than one thousand occasions, at least one half of which shall have been for major surgical procedures These conditions may be modified for candidates who have carried out original investigations in the science or practice of anæsthetics or whose studies have extended over a long period without fulfilling the exact conditions

CHILD HEALTH

English Conjoint Board

Examinations for the D C H are held in March and October The examination (written, oral, and clinical) comprises the following subjects special emphasis being laid on their preventive aspects, (*a*) anatomy, physiology, and pathology of childhood, (*b*) development of the child, physical and mental including speech with its disorders, physical education in childhood, (*c*) hygiene and dietetics of infancy and childhood, (*d*) affections of the new born (*e*) disease in infancy and childhood medical and surgical, (*f*) therapeutics of infancy and childhood including remedial treatment physical and mental, (*g*) legislation and public administration in regard to the care of children including the methods of infant welfare centres and of the school medical service The candidate must have been in a recognised children's hospital or department as resident medical officer for six months or as clinical assistant for a year though these conditions may be modified in the case of candidates who

have carried out original research or whose studies and practice have extended over a long period. Forms of application may be obtained from the secretary, Examination Hall, 8, Queen-square, London, W.C.1.

TUBERCULOUS DISEASES

University of Wales

Candidates may be admitted to examination for the tuberculous diseases diploma (T D D) after the lapse of not less than two years from the date of obtaining a qualification in medicine, surgery, and midwifery, registrable in Great Britain or in the dominions, colonies, and dependencies of the British Empire, or a medical degree approved by the university. Every candidate must have held a resident post in a tuberculosis hospital, or at an orthopædic institution providing not less than 100 tuberculosis beds, or shall satisfy the faculty of medicine that he has pursued a special study of tuberculosis equivalent to the above for a period of not less than twelve months.

The examination is in two parts. Part I (*a*) written and (*b*) oral and practical, including the examination of patients, and the recognition of specimens; Part II is a written and practical examination on the epidemiology, pathology, and bacteriology of tuberculosis. Every candidate will be required to satisfy the examiners in both parts in the same examination. The course of instruction begins in January and continues until May each year, when the examinations are held. Further particulars may be obtained from the secretary, The Welsh National School of Medicine, The Parade, Cardiff.

A limited number of appointments for part-time assistant tuberculosis physicians are advertised annually in September by the Welsh National Memorial Association, enabling suitably qualified and selected candidates to study for the diploma. Particulars on application to the secretary, Welsh National Memorial Association, Memorial Offices, Westgate-street, Cardiff

As these classes have, in recent years, become very large, selection is necessary, and applications should reach the secretary by June 1 of each year.

BACTERIOLOGY

University of London

The course of study for the diploma extends over one academic year and is open to (*a*) graduates in medicine, science, and pharmacy of this or another approved University, whose previous training has, in the opinion of the University, fitted them to profit by the course; and (*b*) registered medical practitioners and other students who, though not graduates, have obtained a qualification and undergone a previous training which, in the opinion of the University, has fitted them to profit by the course.

A course necessary to fulfil the regulations of this diploma has been planned by the London School of Hygiene and Tropical Medicine, Keppel-street, London, W C., and full particulars with regard to the diploma may be obtained from the academic registrar, University of London, the Senate House, W.C.1.

University of Manchester

Candidates must (*a*) have graduated in medicine at Manchester or some other approved university, or (*b*) hold a registrable medical qualification, or (*c*) have obtained some other qualification approved by the senate. They must attend the prescribed course of study in the university. This lasts from October to June and is followed immediately by an examination Particulars may be obtained from the department of bacteriology, Public Health Laboratory, York-place, Manchester.

CLINICAL PATHOLOGY

University of London

The course of study for the D C P extends over one calendar year, and is open to graduates in medicine and to registered medical practitioners. The subjects are (1) morbid anatomy and histology; (2) bacteriology and serology, (3) biochemistry. The examination is held in October. Particulars may be obtained from the academic registrar, University of London, the Senate House, W.C.1. Particulars of the external diploma in clinical pathology may be obtained from the external registrar at the same address.

THE DEFENCE SERVICES

ROYAL NAVAL MEDICAL SERVICE

THE Royal Naval Medical Service offers a very satisfactory career to well-qualified medical men, with excellent opportunities for the practice of their profession and, if they wish, for specialisation. The pay is good and so is the prospect of promotion to higher rank with an adequate pension on retirement. Those who wish to enter the service must be British subjects of British parentage, must be registered medical practitioners and physically fit, and should be between 24 and 28. Additional seniority is given for resident hospital appointments held before joining, up to a maximum of one year.

Surgeon Lieutenants join on a short service basis for an initial period of three years, and their first appointment is to a four months' instruction course at the R.N. Hospital, Haslar, and the R.N. Barracks, Portsmouth. At the end of their second year they may apply to serve for a further two years, making five in all, and this application is seldom refused. Those who leave at three years receive a gratuity of £400. When an officer has reached about 3½ years' seniority he may apply for transfer to the permanent list. His chances of being accepted depend partly on merit and partly on the vacancies available. The chances at present are exceptionally good, for all suitable officers are being accepted. An officer who leaves the service after five years receives £1000 gratuity, and he receives the same sum less income-tax if he is accepted for the permanent list, but in that case he must undertake to serve for 25 years.

PROMOTION

Promotion to Surgeon Lieutenant-Commander is automatic at six years' seniority, provided an officer's service has been satisfactory and he has done two years at sea. During his time in this rank an officer undergoes a five months' course followed by an examination, in which 75 per cent. of marks qualifies for 12 months' special antedate of seniority and 85 per cent. for 18 months'. There is no specific penalty for failure. Officers are promoted to Surgeon Commander at 12 years' seniority, and it is thus possible for an officer who has obtained 12 months' seniority for resident appointments and 12 months' for reaching 75 per cent in the examination to become a Surgeon Commander after 10 years' actual service.

An officer becomes eligible for promotion to Surgeon Captain after 8 years as Surgeon Commander, but those selected have usually been from 11 to 13 years in that rank

The prospects of promotion to higher rank are difficult to estimate At present the total complement of medical officers is about 300 and this number includes 34 Surgeon Captains, 6 Surgeon Rear-Admirals, and 1 Surgeon Vice Admiral The proportion of officers on the permanent list who are eventually promoted to Surgeon Captain has been variously estimated at from 30 to 60 per cent

FOREIGN SERVICE

The proportion of appointments abroad to those at home is now about seven to five This means that junior officers, who must necessarily bear the brunt of foreign service in small ships, will spend the greater part of their time abroad This is attractive to many young men, and even for those who dislike it there is the compensation of foreign service leave which is 15 days for every six months abroad Many young officers returning from 2½ years in China find that the journey home has been sufficient holiday, and spend the bulk of their 2½ months at home doing post-graduate study.

SPECIALIST APPOINTMENTS AND POST GRADUATE COURSES

The policy of the Admiralty is to select specialists young and to keep them employed as specialists as continuously as possible if they are successful They are chosen on their professional experience, both before and after joining the Navy, their degrees and diplomas, and their capacity for team work, but no officer is made a specialist or given courses of instruction until it is certain that he is going to be appointed to the permanent list There are at present about 90 specialist appointments and it is necessary to have more specialists than this to allow for expansion, sickness, and so on

On the average it is intended that each officer shall have three courses of post graduate study during his 25 years' service in addition to the preliminary and promotion courses, but this cannot be guaranteed at present owing to the service being below strength By means of these many officers are enabled to obtain specialist diplomas or higher degrees

OTHER ALLOWANCES

Each officer accepted for service receives an equipment allowance of £50 towards the cost of uniform. Married officers over 30 years of age appointed on shore at home receive a removal allowance, and those employed on shore abroad receive free passages for their wives and families

The following allowances are also paid —

When in charge of hospitals and sick quarters	10*s* and 5*s* a day
Specialist allowance	5*s* a day
Senior medical officers in flag ships	5*s* and 1*s* 6*d* a day
Provision allowance when victualling is not provided	£47 a year

Gratuities —Officers permitted to withdraw instead of receiving a pension receive gratuities on the following scale —

Over 10 and under 15 years service	£500
" 15 " " 18 " "	£1000
" 18 years service	£2000

Widows' pensions —In the event of the death of an officer from any cause attributable to the service his widow and children are eligible for pension Pensions are also usually granted to the widows of officers of over ten years' service who die from other causes

Inquiries regarding the service, and applications for entry should be addressed to the Medical Director-General of the Navy, Admiralty, London, S W 1

FULL PAY, MARRIAGE ALLOWANCE, AND RETIRED PAY

—	Full pay of single officers and married officers under 30 [1]	Full pay of married officers over 30 [1]	Maximum pension for officers over 40	Retiring age
	£	£	£	
Surgeon Lieutenant on entry	438	522	408	45
After 3 years	478	562		
Surgeon Lieutenant-Commander on promotion	541	624		
After 3 years	575	657		
Surgeon Commander on promotion	706	788	543	55
After 3 years	773	855		
" 6 "	840	922		
" 9 "	906	989		
" 12 "	904	1046		
" 15 "	1022	1104		
Surgeon Captain on promotion	1037	1138	816	57
After 3 years	1119	1220		
" 6 "	1201	1302		
" 9 "	1284	1384		
Surgeon Rear Admiral	1734	1734	950	60
Surgeon Vice Admiral (Medical Director General of the Navy)	2263	2263	1022	On vacating office

[1] Lodging allowance at the rate of £80 per annum is payable when service accommodation is not provided As a general rule, lodging allowance will not be payable concurrently with marriage allowance

[2] Children's allowances are paid in addition at the following rates 2*s* a day for first child 1*s* a day for each subsequent child

Inquiries regarding the service, and applications for entry should be addressed to the Medical Director-General of the Navy, Admiralty, London, S W 1

Dental Branch

Candidates must be qualified dental surgeons and under 28 They must be medically fit for active service anywhere

Dental officers are appointed for short service (six years) in the first instance, but may be transferred to the permanent list at the discretion of the Admiralty On withdrawal at the termination of their short service engagement officers will receive a gratuity of £1000 An outfit allowance of £50 is payable on joining

Officers selected for the permanent list will normally be promoted to Surgeon Lieutenant-Commander (D) on transfer Promotions to Surgeon Commander (D) (establishment 15) and to Surgeon Captain (D) (establishment 4) are made by selection The present number of dental officers is 117

An antedate of seniority not exceeding six months may be allowed to officers who held suitable appointments in civil hospitals prior to entry into the service, such time counting for the purpose of (*a*) seniority, (*b*) increments of pay, and (*c*) promotion to the rank of Surgeon Lieutenant-Commander (D), but for no other purpose

Provision has been made for candidates who at the time of entry, hold, or who are about to hold an appointment as dental officer in a recognised civil hospital, to serve in such appointment provided the period of service *after entry* does not exceed six months The time will be allowed to count as indicated above, but pay is not allowed *during* the

period. It will count as service for the purposes of retired pay or gratuity on retirement or withdrawal, however, in the case of officers transferred to the permanent list.

Provision is made for post-graduate courses to dental officers after eight years' service.

The rates of full pay for dental officers are as follows:—

	£	£
Surgeon Lieutenant (D)	362–	447
Surgeon Lieutenant-Commander (D) ..	498–	623
Surgeon Commander (D)	666–	863
Surgeon Captain (D)	991–	1244

Marriage and children's allowances, also other allowances—e.g., removal allowances—are paid to naval dental officers under the same conditions as for other naval officers

Further particulars, including rates of full pay and allowances, retired pay and withdrawal gratuities, can be obtained by application to the Medical Director-General of the Navy, Admiralty, S.W.1.

ARMY MEDICAL SERVICES

Royal Army Medical Corps

Officers are appointed to the Royal Army Medical Corps in the first instance for a period of five years During his fourth year of service an officer can apply for a permanent commission in the Royal Army Medical Corps or the Indian Medical Service Those not granted a permanent commission retire on completion of five years' service with a gratuity of £1000, and are liable to be called up for duty in the event of a national emergency arising during the 12 years following their retirement This gratuity should go a long way towards enabling an officer to establish himself in civil life

New entrants are commissioned in the rank of Lieutenant, and the first three months of their service are on probation, during which time they undergo a course at the Royal Army Medical College in London, in hygiene, tropical medicine, entomology, &c., in addition to their military training at the R A.M C depôt at Aldershot A grant of £50 is made towards the purchase of uniform.

A candidate for a commission in the R A M C who is holding or who is about to hold an approved whole-time appointment at a recognised civil hospital may be granted a commission and seconded while holding his hospital appointment up to a maximum period of 12 months. While so seconded he continues to hold his commission in the R A M C but does not receive army pay and allowances. The period of secondment, however, counts as army service as explained below. A candidate who has held an approved whole-time hospital appointment within six months of entry may be granted an antedate not exceeding 12 months in respect of the period the appointment was held. The period of secondment or antedate does not reckon as part of the five years which he is required to serve on a short service commission, but does count for seniority.

PROMOTION

An officer is promoted to Captain after one year's commissioned service on full pay. If appointed to a permanent commission he is promoted to Major on completion of 10 years' commissioned service, including the period of any antedate granted. Promotion to the ranks of Lieutenant-Colonel and Colonel is by selection to fill vacancies within the establishment, which is designed to allow promotion to those ranks on the average after 17 and 25 years' service respectively.

PROFESSIONAL OPPORTUNITY

The possibilities for good work are very great. There is scope for original research in tropical diseases, in preventive medicine, and in bacteriology, as well as in the large clinical field open to the specialist in medicine, surgery, gynæcology, diseases of the ear, nose, and throat, ophthalmology, and venereal diseases. Child welfare is also undertaken systematically by officers of the R A M.C. Young officers having special qualifications or experience in particular branches can, if found sufficiently expert, be graded as "physician," "surgeon," "otologist," "gynæcologist," "ophthalmologist," &c They are then eligible to fill specialist appointments with additional pay.

FOREIGN SERVICE

The tour of foreign service in India, Burma, and Egypt is five years, in Gibraltar and Malta four years, and in other stations three years, but arrangements are made for officers retiring on a gratuity after five years' service to return to England at public expense by the end of that period.

POST-GRADUATE STUDY

Between his sixth and tenth year of service an officer undergoes a course of post-graduate study at the Royal Army Medical College and the London hospitals of five months' duration, followed by a course of study of a special subject, selected by himself, provided he has shown special aptitude in the post-graduate course or during his previous service. During this course of study he remains on full pay, and the fees for the course are paid by the State.

When qualified in his special subject, the officer up to and including the rank of Lieutenant-Colonel becomes entitled to specialist pay at 4*s* 6*d* per day when holding a specialist appointment

PAY AND ALLOWANCES (HOME RATES)

The rates of pay and allowances for officers are at present as shown in the Table, but the allowance rates vary slightly from time to time An officer below the substantive rank of Colonel holding an appointment as specialist receives 4*s* 6*d*. a day, in addition to his ordinary pay.

CHARGE PAY

	Daily. s	d
(*a*) An officer below the substantive rank of Colonel in charge of a hospital of 50 beds and over, or in charge of a medical or surgical division of a general hospital with at least 300 beds .	5	0
(*b*) Senior Medical Officer, Royal Arsenal ..	5	0

Assistant professors at the Royal Army Medical College (Lieutenant-Colonels) receive pay and allowances of their rank plus £90 10*s*. a year.

RETIREMENT AND RETIRED PAY: OFFICERS HOLDING PERMANENT COMMISSIONS

The following are the rates of retired pay:—

1. For officers below the rank of major-general retired pay consists of two parts. (*a*) a service element based on the officer's total service, (*b*) a rank element for the rank from which the officer retires.

2 The scale will be as follows:—

(*a*) Service element: £13 11*s* 6*d*. for each completed year of service as a medical officer.

PAY AND ALLOWANCES (HOME RATES)

Appointment	Pay	Rations	Servant	Married officers over 30			Unmarried officers		Total per annum	
				Lodging	Fuel and light (average)	Furniture allowance	Lodging	Fuel and light (average)	Married	Unmarried
	A day £ s d	A day s d	A day s d	A day s d	A day s d	A day s d	A day s d	A day s d	£	£
Lieutenant	0 19 10	1 8	2 0	3 6	1 8	2 0	2 6	0 8	560	487
Captain	1 4 6	1 8	2 0	4 6	2 11	2 0	2 6	0 8	686	572
After 6 years service	1 7 2	1 8	2 0	4 6	2 11	2 0	2 6	0 8	721	621
" 8 " "	1 9 4	1 8	2 0	4 6	2 11	2 0	2 6	0 8	774	661
Major	1 14 0	1 8	2 0	4 6	3 0	2 0	4 0	1 4	861	785
After 13 years service	1 18 6	1 8	2 0	4 6	3 0	2 0	4 0	1 4	943	867
" 16 " "	2 0 8	1 8	2 0	4 6	3 0	2 0	4 0	1 4	983	906
" 18 " "	2 2 4	1 8	2 0	4 6	3 0	2 0	4 0	1 4	1068	922
" 22 " "	2 8 10	1 8	2 0	4 6	3 0	2 0	4 0	1 4	1132	1055
Lieutenant Colonel	2 12 0	1 8	2 0	4 6	3 1	2 0	4 6	2 6	1191	1144
After 3 years service as such	2 16 6	1 8	2 0	4 6	3 1	2 0	4 6	2 6	1273	1226
Colonel	3 3 4	1 8	2 0	5 6	4 1	2 0	5 6	2 10	1434	1379
Major-General	4 10 6	1 8	4 0	11 0	5 2	2 0	11 0	4 0	2087	2029
Director General	5 8 8	1 8	6 0	13 9	5 9	2 0	13 0	4 7	2513	2455

(b) Rank element

Rank from which retired	After completing 1 year's service in the rank	After completing each additional year's service	Maximum rank element
	£ s d	£ s d	£ s d
Major	10 17 3	10 17 3	108 12 0
Lieutenant Colonel	135 15 0	27 3 0	217 4 0
Colonel	202 9 0	45 5 0	352 19 0

Maximum rates of retired pay

	£ s d		£ s d
Major	407 5 0	Major General	950 0 0
Lieutenant-Colonel	543 0 0	Lieutenant General	1120 0 0
Colonel	724 0 0		

The retired pay of an officer retiring with less than one complete year's service in the rank from which he retires will be assessed as though he had retired from the rank below

3 An officer with less than 20 complete years' service will not be eligible to retire voluntarily on service retired pay

4 Officers may be permitted to retire with a gratuity in accordance with the following scale :—

With 5 and less than 10 years service as a medical officer	£1000
After 10 years' service as a medical officer	£1600
" 15 " " " "	£2800
" 18 " " " "	£3500

Normal entry takes place twice yearly at the beginning of May and November Interim entries are arranged for February and September

Regulations for admission giving full details and application forms, should be obtained from the Assistant Director General Army Medical Services (A M D 1) The War Office Whitehall, London, S W 1

The Army Dental Corps

This Corps is administered by the Dirs tor General, Army Medical Services who is assisted by the Director Army Dental Service

APPOINTMENT AND PROMOTION

The appointment of officers to the Army Dental Corps is, in the first instance by means of a short service commission for a period of six years In the fifth year an officer is given the opportunity of applying for a permanent commission Those not desirous of a permanent commission, or not selected, retire on completion of six years' service with a gratuity of £1000 They are liable to be called up for duty in the event of a national emergency during the 12 years following their retirement

New entrants, who must be duly qualified under regulations approved by the Army Council, are commissioned in the rank of Lieutenant

A candidate for a commission in the Corps who is holding or who is about to hold an approved whole time appointment in a recognised civil hospital may be granted a commission and seconded while holding his hospital appointment for a period not exceeding six months While so seconded he will continue to hold his commission in the Corps, but will not receive army pay or allowances The period of secondment will, however, count as army service as stated below A candidate who has held an approved whole time appointment in a recognised civil dental hospital or in the dental department of a recognised civil general hospital may be granted an antedate covering the period of his appointment, but not exceeding six months, provided that the interval between the termination of the hospital appointment and the date of entry into the Service does not ordinarily exceed six months The period of secondment or antedate in respect of a hospital appointment will not reckon as part of the six years which he is required to serve on a short service commission, but on completing one year of actual service in the Army Dental Corps it will count for seniority It will also count for increment of pay dependent upon length of service and after appointment to a permanent commission, for promotion to the rank of Major, and towards retirement on retired pay or with gratuity

An officer is eligible for promotion to Captain after one year's service and to Major after ten years' service in the Corps, provided he has qualified in such manner as may be prescribed by the Army Council Promotion to the ranks of Lieutenant Colonel and Colonel is made by selection from those senior in the rank below

PAY AND ALLOWANCES

The rates of pay are slightly less than those of the Royal Army Medical Corps, the difference varying from 1s 8d in the rank of Lieutenant to 2s 2d in

the rank of Colonel. Allowances are at the same rates as for officers of the Royal Army Medical Corps.

RETIREMENT AND RETIRED PAY OR GRATUITY

The rates of retired pay are the same as for officers of the Royal Army Medical Corps. Voluntary retirement on retired pay is not allowed until after 20 years' service

Earlier retirement on gratuity may be allowed:—

After 6 years'	service as a Dental Officer,	gratuity of £1000
" 10 "		" £1350
" 15 "		" £2250
" 18 "		" £3000

The aim of the Corps is the prevention of wastage on account of dental disease or dental deficiency, and, to enable this to be carried out, every recruit is inspected by a dental officer immediately after joining and all necessary treatment carried out. The soldier is reinspected at least once a year and the dental efficiency maintained at the best standard possible.

The regulations for admission to the Corps may be obtained from the Under-Secretary of State, War Office, London, S W.1.

MEDICAL BRANCH OF THE ROYAL AIR FORCE

The Air Council attach great importance to attracting into the Service the best type of medical man since on the capacity of the Medical Branch depends in a peculiar degree the safety and efficiency of the Air Force The duties of a medical officer in the Air Force include not only the prevention and treatment of those ordinary diseases to which the personnel of any fighting service are liable, but the special study of the mental and physical stresses imposed on the airman in diverse circumstances and climates—a new branch of medicine which still provides considerable scope for research.

With the Air Force now increasing enormously the prospects offered for the study of the special medical aspects of aviation are greatly enhanced, and there are many more opportunities for gaining experience and for employment in specialist and general medical work and in administrative posts

The work has a high professional interest combined with good rates of pay and allowances and the life is certain to appeal to the man of wide outlook who desires opportunities for travel, sport, and games, and can find interest and enjoyment in aviation. His duties will give him flying experience as a passenger, which is necessary for the proper study of the medical problems of aviation and for gaining first-hand knowledge of the conditions under which his comrades serve He may also, if he wishes, learn to fly, when this can be arranged without interference with his duties

The establishment consists partly of permanent and partly of short service officers, and an officer on entry is granted a short service commission for a period of three years on the active list (which may be extended to five years) and of four years in the Reserve of Air Force Officers. Selections for permanent commissions are made from officers holding short service commissions who are considered to be suitable and who desire a life career in the Service. Those who are not selected are transferred to the Reserve at the expiration of their period of service on the active list.

But the short service commission with its gratuity after three or five years is in itself an attraction to many entrants who desire to enlarge their experience and outlook from the point of view of subsequently entering private practice, and who, on entry, have not made up their minds to the adoption of a permanent career in the Service.

For certain purposes medical officers are allowed to count as service their time spent in approved whole-time post-graduate appointments in civil hospitals under certain well-defined and generous conditions.

After about five years' service all permanent officers who are judged suitable are given the opportunity to take a course of specialist study towards the expense of which an allowance is made Their subsequent career is normally as follows. Approximately three-quarters of the employment of squadron leaders and senior flight lieutenants is in specialist posts, though these are not generally of a full-time specialist character. On reaching the rank of wing commander, the policy is to allow a proportion of officers to become permanent specialists and to be employed continuously throughout the remainder of their career in full-time specialist posts In addition there are a number of hygiene posts in the rank of wing commander open to specialists in that subject thus further increasing the proportion of specialist posts open to officers. In the rank of group captain, apart from the posts already mentioned as available for the permanent specialist, employment is nearly equally divided between posts in charge of a large hospital and headquarter administrative posts. This statement indicates the position as regards specialist employment as at present foreseen.

New entrants into the Royal Air Force Medical Branch are commissioned as Flying Officers (Medical), and are eligible for promotion to the rank of Flight Lieutenant (Medical) after one year's service on full pay Accelerated promotion to the rank of Squadron Leader may be granted at any time after the completion of eight years' service to officers qualified to hold specialist appointments; those officers who are not so qualified are eligible for promotion to this rank after ten years' total service Promotion within establishment to the ranks of Wing Commander and above is by selection The number of permanent commissions granted yearly is regulated with a view to all suitable permanent officers being promoted to Wing Commanders and of a substantial proportion of Wing Commanders being promoted to Group Captains

There is no competitive examination on entry; candidates, who must be under 28,[1] are interviewed by a board presided over by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce:—

1. Birth certificate 2. Medical registration certificate 3. A declaration containing the following information: (*a*) Age and place of birth (*b*) That he is a British subject, the son of British subjects, and of pure European descent (*c*) That he is ready to engage for general service at home or abroad as required. (*d*) The qualifications he is possessed of, and what medical or other appointments he has held (if any). (*e*) That he is willing to fly as a passenger whenever called upon to do so

Each candidate is required, before acceptance, to pass a medical examination On appointment entrants undergo a course not exceeding three months during which they are given instruction in the special medical aspects of aviation, hygiene, and tropical medicine, the organisation and administration of the Royal Air Force, and the general and special duties to be performed by officers in the Medical Branch.

[1] As a temporary measure applications will be received from candidates up to the age of 31.

EMOLUMENTS

The emoluments of medical officers of the Royal Air Force are given in outline below The rates of pay

Rank	Pay (per annum)	Allowances (per annum) (present home rates)	
		Married	Single
	£	£	£
Flying Officer	394	198	125
Flight Lieutenant	429	237	125
Ditto, after 2 years as such	462	237	125
Ditto, „ 4 „ „	496	237	125
Squadron Leader	644	240	164
Ditto after 2 years as such	709	240	164
Ditto, „ 4 „ „	742	240	164
Ditto „ 6 „ „	809	240	164
Wing Commander	909	240	193
Ditto, after 2 years as such	943	240	193
Ditto, „ 4 „ „	1046	240	193
Group Captain	1166	313	254
Air Commodore	1320	370	315
Air Vice Marshal	1652	433	376

Special allowances are applicable at stations abroad

are fixed on an inclusive basis, and the fact that specialist pay and charge pay are not payable as separate emoluments was taken into account when the rates were fixed

In addition to pay, officers receive quarters (with fuel and light), rations, and attendance, or, if these are not available in kind, they are given cash allowances in lieu as shown in the Table The rates and general scheme of allowances are subject to review as circumstances may require Married officers over 30 receive either married quarters or allowances at the married rates

UNIFORM AND EQUIPMENT

An allowance of £50 towards the cost of uniform is made on joining to candidates who have not had previous commissioned service in H M Forces

LEAVE

Subject to the exigencies of the Service, officers at home are allowed ordinary leave up to sixty one days in a year, officers abroad may accumulate leave up to 91 days, which may be taken on return home Full pay is granted for ordinary and accumulated leave

DISABILITY AWARDS, WIDOWS' PENSIONS, &C

Permanent medical officers invalided from the Royal Air Force are eligible for retired pay or gratuity however short their service may have been If their disability is attributable to the conditions of their service and is assessed at 20 per cent or more, they receive an additional payment, varying according to the degree of disablement Provision is also made in the regulations for pension to the widow and allowances to children or dependants of a deceased officer

RETIRED PAY

The minimum period of service qualifying for retirement on retired pay is 20 years The maximum rates of retired pay and the compulsory retiring ages for the several ranks are —

Rank	Yearly rate of retired pay	Compulsory retiring age
	£ s	
Air Vice Marshal	1,050 0	60
Air Commodore	800 0	59
Group Captain	614 10	57
Wing Commander	513 0	55
Squadron Leader	452 10	55

Gratuities —A permanent officer allowed to retire before having qualified for retired pay may be granted a gratuity, namely —

£1000 if he has 5 but less than 10 years commissioned service
£1500 „ „ 10 „ „ 15 „ „ „
£2800 „ „ 15 or more than 15 „ „ „

Short service officers who complete their full period of service on the active list will normally be granted gratuity as follows on transfer to the Reserve —

After 3 completed years	£100
„ 5 „ „	£1000

These gratuities will not be payable to officers granted permanent commissions, but their service on a short service commission will count towards retired pay

GENERAL

The pay of officers even in the lowest rank is ample to enable them to be independent and the expenses of Air Force messes are strictly limited, in order to check all tendency to extravagance and to prevent even the most junior officer from finding difficulty in living on his pay The regulated limit of the daily rate of messing is 5s and the average rate at present charged at home stations is 3s 6d Subscriptions and the cost of mess entertainments are charged according to an officer's rate of pay, and an unmarried officer taking his full share in the life of the mess should not incur a mess bill of more than £10 a month (6s 8d a day) This sum would include a wine bill of £1 a month (an actual average figure) but would not include goods, such as tobacco, bought through the mess Further information may be obtained from the Under Secretary of State, Air Ministry (D M S) Adastral House, Kingsway, London, W C 2

HEALTH SERVICES AT HOME

PUBLIC HEALTH

The public health service in this country dates from 1847 when the first medical officer of health was appointed Such appointments became generally compulsory in 1872, and during the present century the service has grown so rapidly that it now includes not only medical officers of health, but also officers for tuberculosis, for venereal disease, for maternity and child welfare, and for school medical work, as well as a large number of assistants of various grades Any young medical man or woman desirous of entering the public health service should first of all obtain resident appointments in general and in special hospitals such as those for children's diseases or infectious diseases before proceeding to the course of study for a diploma in public health

No medical officer of health may be appointed unless he is the holder of a registered diploma in public health or its equivalent His appointment must receive the sanction of the Minister of Health and cannot be terminated without the consent of the Minister The course of training required for the diploma in public health and the scope of the examinations are controlled by rules of the General Medical Council and the Minister of Health has made regulations prescribing the experience required of persons applying for any of the following specialist appointments tuberculosis officer or sanatorium superintendent venereal disease pathologist venereal disease officer, senior maternity and child welfare medical officer and medical officer of an antenatal clinic Vacancies as they occur are advertised in the medical journals and all these appointments are

pensionable and carry salaries in accordance with a scale embodied in an agreement between the British Medical Association and the associations of local authorities known as the Askwith Memorandum. This lays down minimum commencing salaries for medical officers of health on a population basis (the lowest figure being £800); a scale of salaries for senior medical officers (those responsible for the work of a department under the M.O.H.) rising from £750 to 25 per cent. or more above that commencing figure; a scale for assistant medical officers in departments of £500 rising by annual increments of £25 to £700; and a scale for resident medical officers in hospitals of £350, rising by £25 to £450, together with board, lodging, laundry, and attendance—emoluments which are generally held to be equivalent to £150 per annum.

The present whole-time personnel of the public health service (including officers holding appointments in tuberculosis and infectious diseases, but not general, hospitals) in England and Wales is about 1800. Of these about 450 are medical officers of health, with salaries ranging from £800 to £2000 or more in the case of a few of the larger authorities. Next come some 300 appointments on the senior medical officer scale (£750 rising to £940 or more), including those of deputy or senior assistant medical officers of health, senior tuberculosis officers, senior assistants for school medical or maternity and child welfare work, and medical superintendents of isolation hospitals and sanatoria. There is also an intermediate class of some 350 assistant medical officers whose salaries rise to maxima between £750 and £900. Lastly there are about 650 to 700 junior assistant medical officers and resident medical officers of isolation hospitals and sanatoria; it is known that some 200 of these now receive a commencing salary of £600 or more instead of the £500 laid down in the Askwith Memorandum.

Thus it will be seen that the prospects of becoming at least a senior medical officer are not unpromising for a competent man or woman who enters the public health service, and those whose bent is clinical rather than administrative will find plenty of scope in the variety of public health medical services controlled by local authorities.

London School of Hygiene and Tropical Medicine

The course for the University diploma in public health will begin at Keppel-street on Sept. 25th. The inclusive fee is fifty-four guineas. Full-time attendance is compulsory under the revised rules of the General Medical Council for Part I of the course which lasts from September to December. Part II of the course for full-time students lasts from January to June. Arrangements have been made for a limited number of candidates selected for certain appointments in the L.C.C.'s special hospitals to attend as part-time students for the second part of the course. In their case part-time instruction will be given from January to the following December. With the exception of this group all students are expected to devote their whole time to the course.

The curriculum has been planned on very practical lines and, in addition to work with medical officers of health in selected areas and the necessary instruction in infectious disease and hospital management, it includes a large number of visits to places of public health interest. Lectures are given by authorities on special subjects, and these are open to members of the medical profession generally as well as to students of the School. During the academic year a course on mental deficiency is provided which members of the public health class may attend. It is designed to enable qualified medical practitioners to secure recognition by the Board of Education as certifying officers, so far as elementary school-children are concerned, under the Mental Deficiency Acts.

Royal Institute of Public Health and Hygiene

Facilities are offered at 23, Queen-square, London, W.C.1, for students training for the D.P.H. Candidates holding appointments are admitted to the Part 2 course as part-time students. There are well-equipped laboratories where practical instruction is given in chemistry, bacteriology, immunology, and public health subjects, and analyses are undertaken, both chemical and bacteriological, of milk, water, and sewage effluents, providing excellent teaching material. Particulars may be obtained from the secretary at 28, Portland-place, W.1.

L.C.C. HOSPITALS

THE hospital service of the London County Council provides opportunities for valuable experience for medical graduates who intend to be general practitioners or consultants, as well as for those who intend to make the public health service their career. The L.C.C. is responsible for the management of 76 hospitals (excluding mental hospitals)—namely, 28 general hospitals (including 1 for children), 12 special hospitals for the chronic sick, 2 convalescent hospitals for general cases, 2 hospitals for sane epileptics, 16 fever and other hospitals for infectious diseases, 9 tuberculosis hospitals (including 3 for children), 5 special hospitals and convalescent homes for children, 1 hospital for the treatment of ophthalmia neonatorum and vulvo-vaginitis in children, and 1 for the treatment of venereal disease.

Medical superintendents of the hospitals, who are expected to be experienced hospital administrators, receive £850–£1650 a year, corresponding to hospitals varying in accommodation from 160 to 1300 patients. In addition, medical superintendents are provided with an unfurnished house or quarters, with payment by the Council of local and water rates.

The subordinate staff is classified thus:

Grade	Scale of annual salary
Deputy medical superintendent, class I	£650–£50–£800
Deputy medical superintendent, class II	£600–£30–£750
Deputy medical superintendent, class III	£550–£25–£650
Deputy medical superintendent, class IV	£500–£25–£600
Senior resident surgeon, physician or obstetrician, and senior assistant medical officer	£500–£25–£600
Assistant medical officer, class I	£150–£25–£125 rising to £450 if placed on promotion list
Assistant medical officer, class II	£250 (fixed)

In addition, all these officers are provided with board, lodging, and washing. All the positions mentioned involve full-time duties, and it is a condition of service that such officers shall not undertake any other paid employment without special authority. The staffing provides, where necessary, for house physicians or house surgeons, paid at the rate of £120 a year with residence, and for clinical assistants, who are non-resident and receive £150 a year with meals when on duty. These officers are not employed in a whole-time capacity and are granted adequate leisure for study.

A number of positions of assistant medical officer classes I and II in the infectious hospitals are filled by a new grade of junior assistant medical officer, recruited from medical practitioners taking part II of the diploma of public health at the London School of Hygiene and Tropical Medicine.

Deputy medical superintendents who occupy unfurnished houses or quarters (married quarters) free of charge and rate free in the hospitals, are paid £50 a year in addition to the salary scales set out above

Vacancies in the higher grades are filled, as far as possible, by promotion from the existing staff For subordinate staff, the extent and fluidity of the hospital service provides unique opportunities for a variety of experience, and facilities exist for specialisation and for officers to follow courses of study outside the service with a view to improving their professional qualifications

During the past year 177 vacancies have been filled, including 1 position as medical superintendent, 1 as deputy medical superintendent, 9 as senior assistant medical officers, 103 as assistant medical officers, and 63 as house surgeons, house physicians, or clinical assistants In addition, a large number —more than 200—of part-time consultants and specialists are employed in the various hospitals These appointments, which vary from 1 to 8 sessions a week, include physicians, surgeons obstetricians and gynæcologists, anæsthetists pædiatrists, neurologists, neuro surgeons, orthopædists, radiologists, dermatologists, ophthalmologists urologists and ear, nose, and throat specialists Other part time consultants and specialists are employed for special purposes—e.g., venereal diseases specialists and plastic and thoracic surgeons—and the services of a tuberculosis officer are available at each general hospital having a tuberculosis ward There are 7 part time obstetricians and gynæcologists employed at certain of the council's general hospitals The salary attached to these positions is £800 a year if the appointment covers two hospitals with large maternity departments, and £600 a year if it covers one such hospital These officers, who devote the equivalent of half their time to the work of the maternity units visit each of the hospitals to which they are attached daily (including Sundays if necessary) and as required Subject to the administrative supervision and control of the medical superintendents they are responsible for the whole of the obstetric and gynæcological work of the hospitals to which they are attached

In addition to the director of the radiological department of Hammersmith Hospital and consulting radiologist to the Council's hospitals and the assistant radiologist at that hospital three full time radiologists are employed at groups of hospitals A full time surgeon specialist in radiotherapy is employed at Lambeth Hospital, another for fracture cases at Lewisham and St James Hospitals, and a cardiologist to cover all the council's hospitals The salaries of these range from £1250 to £1500 a year

A comprehensive pathological service has been established There are seven group laboratories, each of which serves a number of hospitals, a central histological laboratory and a serum institute, whilst attached to each of the group laboratories are the subsidiary laboratories situated in the various hospitals A total staff of 27 is attached to these laboratories and apart from supervision or actual performance of laboratory work they act as consultants in pathology, morbid histology, and the like

PRISONS

Whole-time appointments—At the larger prisons the medical officerships are full time appointments, and at certain establishments deputy medical officers are appointed to assist in the work Whole-time medical officers are in two classes medical officers, class II, £525 a year proceeding by annual increments of £25 to £800 a year (the commencing salary for those holding the diploma of psychological medicine being £575 per annum), medical officers, class I, £800 a year proceeding by annual increments of £30 to £1000 a year Unfurnished quarters are provided or an allowance in lieu is made The posts are pensionable The initial appointment is to the class II grade with prospects of promotion to the higher rank Of the whole time Prison Medical Service 17 are class II and 12 are class I Promotions from class II to the rank of medical officer, class I, are made as vacancies occur Three of the senior medical officers receive an additional allowance of £50 per annum, and at certain prisons, medical officers receive fees for giving evidence in the criminal courts Candidates must be fully qualified and registered Preference is given to those who have held house appointments, have had experience in mental diseases and psychological methods, and are between the ages of 25 and 35 years

Part time appointments—The medical officerships of the smaller prisons, where the work is insufficient to occupy a man's whole time, are usually filled by local practitioners, who combine the prison work with their own practice The salary paid for such part time work varies according to the extent of the duties required Such appointments may be terminated with notice at any time, and the holders are not entitled to pension

Further particulars can be obtained from the Secretary (Staff Branch) Prison Commission, 62/64, Baker street London W 1

SERVICES ABROAD

INDIAN MEDICAL SERVICE

FUI OI EAN OFFICERS

ADMISSION to the Service is by selection and nomination by the Secretary of State for India Candidates should be under 32 years of age and must possess a registrable qualification The Service is designed primarily to meet the needs of the Indian Army, but in order to maintain the necessary minimum war reserve of military medical officers, and to provide for European medical attendance for European officers of the superior civil services and their families provincial governments are required to employ a stated number of Indian Medical Service officers Certain posts under the Government of India are also reserved for members of the Service It is a definite condition of service that officers are liable to serve on either the civil or the military side On first appointment an officer is required to serve for a period in the military branch and will not normally be considered for appointment to the civil branch until he has done two years service, including at least one year in India. Executive medical officers in both civil and military employment may attend persons unconnected with Government service provided their duty admits of it On the military side, however, the opportunities for private practice are not great The commissions of officers who before appointment have obtained certain higher medical qualifications or have held approved whole time appointments in a recognised civil hospital may be antedated in either case by one year or on the two counts combined by not more than 18 months

PROSPECTS

During the past few years the prospects of the I.M.S. have become brighter, and those in touch with the realities of the situation are of opinion that its attractions are now as great as ever. There is ample scope for men who have specialised in medicine, surgery, and midwifery, and for those with an aptitude for research. The chief attraction perhaps is the variety of careers which the Service offers Pay and pensions are good and although junior officers who are married must expect to live quietly if they are to avoid exceeding their incomes, they have a great advantage over private practitioners in that they are automatically saving considerable sums of money in the shape of provision for a pension on retirement.

After an exhaustive investigation it has been decided that the civil side of the I.M.S. must be retained for the purpose of providing a war reserve. It has also been ruled that a number of specialist and other civil appointments are to be reserved for European officers of the Service. These appointments include 31 specialist posts under provincial governments, and 84 civil surgeoncies and other posts under the central government, the crown representative, and provincial governments There are 24 further posts open to Indian and European officers, including 12 medical research appointments. Highly qualified men have therefore a good chance of securing congenial civil appointments after a varying period of military service.

Those who enter the Service at an early age have an advantage over those who delay till several years after qualification. The ideal course is to enter after spending a year in a resident hospital appointment, for the candidate can then usually enter the Service with the rank and pay of a captain.

A point often overlooked by young doctors is that the I.M.S. offers permanent commissions to European candidates, so that recruits can look forward with confidence to a settled career instead of experiencing the doubts and anxieties associated with temporary commissions. The Service also offers all the advantages of the short-service system: a European officer can retire after six years with a gratuity of £1000, or after twelve years' service with one of £2500. But although many men have joined up with the intention of taking the gratuity, very few have actually done so; it is reasonable to infer that the conditions of service prove attractive to the great majority of entrants. Despite the changes which have been constantly occurring throughout the history of the Service, there has never been a time when men of ability and enterprise have been unable to carve out distinguished careers for themselves Whatever changes the future may bring, the time is remote when there will cease to be a demand for the best class of European doctor in India No other Service offers such a combination of financial security and varied professional opportunity. There is little need to fear the risks to life and health in India; the death-rate among British troops which was 13 per thousand in 1900 is now less than 2 5 per thousand. The distance of India is being diminished in a corresponding degree; it will soon be possible to travel from Karachi to London in less than three days. Those who are interested in the Indian Medical Service should consult one of its junior members; retired officers are now as ever prone to emphasise the goodness of the old days

Recruitment during the past few years has been highly satisfactory both in number and quality of the accepted candidates, so that a very small number of vacancies now exists. Only men of exceptional attainments are likely to be successful in their applications for commissions, and, although the age limit is still 32 years, preference will probably be given to candidates who are under 28

RATES OF PAY

The monthly rates of pay for European officers of non-Asiatic domicile in the Service are as tabulated below. The rupee is worth about 1s. 6d, and rupees per month may easily be converted into pounds per annum by multiplying by nine-tenths

Year of service	Rank	Basic pay, Rs per month	Overseas pay, £ per month	Total, £ per annum
1	Lieutenant	450	15	585
2	Captain	500	25	750
3–4	"	550	25	795
5	"	600	25	840
6	"	600	30	900
7–8	"	700	30	990
9–10	"	700	35	1050
11	Major	800	35	1140
12–15	"	800	40	1200
16–18	"	950	40	1335
19–20	"	1100	40	1470
21–23	Lieutenant-Colonel	1350	40	1695
24–25	"	1500	40	1830

Officers on appointment receive an outfit allowance of £75 Officers in command or second-in-command of the larger station hospitals, receive special allowances On the civil side there are public health, bacteriological, research, and professional appointments carrying special enhanced rates.

Special high rates of pay are also attached to the numerous administrative appointments open to officers in both branches of the Service. The appointment of Director-General, I.M S, for instance, carries pay of Rs 3500 a month

PENSIONS AND ALLOWANCES

The rates of pensions are as follows:—

Service	Rates per annum	Service	Rates per annum
After 17 years ..	£372	After 23 years ..	£576/10/-
" 18 " ..	400	" 24 " ..	614
" 19 " ..	428	" 25 " ..	651
" 20 " ..	465	" 26 " ..	697/10/-
" 21 "	502	" 27 " ..	744
" 22 "	539/10/-		

There are additional pensions ranging from £65 to £350 per annum for officers who have held high administrative appointments

Officers on appointment are provided with free passage to India, normally by transport The wives and families of officers who are married before embarkation on their first appointment will also be given free passage to India subject to the payment of messing charges Officers are granted a certain number of return passages home for themselves, their wives and children at Government expense during their career. There are special allowances for officers whilst on study leave

Further particulars can be obtained on application to the secretary, Military Department, India Office, Whitehall, London, S.W.1. Letters should be marked "Recruitment for I.M S."

WOMEN'S MEDICAL SERVICE FOR INDIA

Among careers open to medical women abroad the Women's Medical Service for India deserves honourable mention. Admission is made by selection in India and England, preference being given to those with Indian experience. The Service is open to fully qualified medical women of British or Indian nationality, and with the present amount of Govern-

ment subsidy the number of full medical officers is limited to 44 There are six to ten temporary officers, and in addition there is a training reserve of about fourteen recently qualified women holding degrees in medicine of Indian universities Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language For a further period they are appointed to act temporarily for medical women on furlough They are then definitely appointed to the charge of hospitals Private practice is allowed, provided it does not interfere with official duties The only exception is in administrative or educational posts, when an allowance in lieu of practice is given The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year

Excellent opportunities for surgery, gynæcology, and midwifery are found in the Women's Medical Service Opportunities are likely to open in the future in connexion with maternity and child welfare Doctors in charge of hospitals have ample scope for administration and their duties always include some teaching of Indian nurses and dispensers, as well as training young medical women as house surgeons and physicians Teaching posts at Medical Colleges and Schools for Women form about one third of the total sanctioned posts in the Service

The cost of living in India is much higher than formerly, but it should be possible for a medical woman (with house provided) to meet actual household expenses on about Rs 350 a month, leaving the remainder of her salary for dress and personal expenses To this must be added the necessary saving to meet additional expense for furlough and leave spent in the hills Rates of pay range from Rs 450 a month with Rs 100 a month overseas allowance to Rs 850 with Rs 150 a month overseas allowance

Furnished quarters are provided, representing an additional Rs 150 a month or an allowance is given instead

Leave on average pay is earned at the rate of 2/11ths of the period spent on duty, and study leave is granted to the extent of 12 months in the total service Officers of European domicile are entitled to four free return first class passages from a port in India to a port outside India in their whole service There is a provident fund to which members of the Service contribute 10 per cent of their pay The Service contributes another 10 per cent, which accumulates at interest and is repaid on retirement

Vacancies are few, usually three or four only in each year Candidates in the United Kingdom should apply to the medical adviser Countess of Dufferin's Fund, care of the High Commissioner for India, India House Aldwych London W C 2 Candidates in India should apply to the Chief Medical Officer, Women's Medical Service, Dufferin Office Red Cross Building, New Delhi

COLONIAL MEDICAL SERVICE

THE Colonial Medical Service consists of officers holding scheduled appointments in the following dependencies which are administered under the direction of the Secretary of State for the Colonies :—

(a) *Tropical Africa*—Kenya, Nyasaland, Tanganyika Territory, Uganda Somaliland Zanzibar, Northern Rhodesia, Nigeria, Gold Coast Sierra Leone and Gambia. (b) *Eastern colonies and protectorates*—Ceylon Hong Kong Straits Settlements and Malay States (c) *West Indian and neighbouring colonies*—Jamaica, Bahamas, Barbados, Bermuda, Windward Islands, Leeward Islands, Trinidad, British Guiana, and British Honduras (d) *Western Pacific*—Fiji, Gilbert and Ellice Islands, and British Solomon Islands (e) *Mediterranean*—Cyprus and Gibraltar (f) *Middle East*.—Palestine (g) *Various islands*—e g, Mauritius, Seychelles, Falkland Islands, and St Helena

The various colonial Government medical departments employ about 700 European medical officers and also a large number of qualified Asiatic and African medical officers who are appointed locally Included in this total are about 30 qualified European lady medical officers About 850 trained nursing sisters and health visitors are employed, most of whom are Europeans In addition there are large numbers of subordinate personnel, sanitary inspectors, medical assistants, and dressers, most of whom are natives of the areas in which they serve

An officer of the Colonial Medical Service has opportunities for the practice of his profession in general medicine and surgery as well as in the special branch of tropical medicine On joining a medical department his duties include medical, surgical, and public health work He may be posted to an outlying or bush station where he will be responsible for all the medical activities in connexion therewith, or he may be attached for duty at one of the large hospitals Every encouragement will be given to him to pursue any specialist work in which he is interested Great importance will be attached to a candidate's post-graduate experience, as in the outlying districts he will often be called on to deal with emergencies without being able to seek the advice and assistance of his colleagues

VACANCIES

Vacancies for medical officers may occur at any time of the year and are dealt with as circumstances require, 47 vacancies were filled in 1937 and 54 in 1938 In normal circumstances vacancies are most frequent in Tropical Africa and Malaya In the West Indian colonies, Ceylon, and Mauritius the junior posts are almost always filled by the appointment of qualified local candidates, in Malta all posts are so filled

The vacancies for which candidates are selected from outside the Service are generally those for ordinary medical officers Appointments for specialists are almost invariably reserved for officers who are already in the Service, and who have shown outstanding merit in a particular branch of medicine or surgery A few vacancies may be expected annually, usually in West Africa and Malaya, for lady medical officers

QUALIFICATIONS AND TRAINING

Candidates must be fully qualified British subjects under 35 Preference is given to candidates who are under 30, and to those who have held hospital or public health appointments, or who have special knowledge of medicine surgery, anæsthetics radiology, ophthalmology, gynæcology and midwifery, &c Lady medical officers must have had experience in maternity and child welfare work

Selected candidates are normally required to undergo a course of instruction in tropical medicine and hygiene at the London School of Hygiene and Tropical Medicine the Liverpool School of Tropical Medicine or at Edinburgh University before taking up their appointments The cost of tuition and the diploma examination fees, if the candidate is successful are paid by the Government together with an allowance of £25 a month during the period of

instruction. If an officer has not taken a course of instruction in tropical medicine before appointment, he is usually required to take one during his first leave of absence.

EMOLUMENTS

When considering the scales of salary offered in the Colonial Medical Service, candidates are particularly advised to consider the general conditions of service It will frequently be found that the actual value of an appointment is considerably greater than is indicated by the salary alone. For example, all scheduled appointments are pensionable, in most dependencies free quarters (or allowances in lieu) are provided, and in almost all, free medical attendance Passages are also, generally speaking, provided at Government expense when an officer proceeds on leave, for himself and his wife; and assistance is given towards the cost of passages for his children In those colonies in which income-tax is payable, the rates are usually much lower than in the United Kingdom. At the same time, the cost of living in the dependency concerned should be taken *into account in order to obtain a true comparison*, and candidates should therefore consult the handbook "Information as to the Conditions and Cost of Living in the Colonial Empire" which is published by the Stationery Office at 3*s* 6*d*.

Salaries vary in the different dependencies, and it is not possible to set them out here in detail The commencing rates range from £500 a year in Cyprus to £600 and £660 in Tropical Africa and £700 in Malaya and Hong-Kong. Most officers have a normal expectation of reaching £1000 a year or more by increments, subject only to efficiency, and there are many higher-grade, specialist, and administrative posts carrying *salaries from £1150 up to £2000 a year. The actual* number of posts and rates of salary can be obtained from the director of recruitment at the Colonial Office.

GENERAL CONDITIONS OF SERVICE

Probation.—Officers are normally appointed on probation in the first instance. The period is usually two or three years, and officers whose service has been satisfactory are then confirmed in their appointments, their period of probation being counted as part of their pensionable service

Acting and other allowances.—An officer appointed to act in a higher post in the absence of the substantive holder of that post is usually granted an allowance in recognition of the additional responsibilities which he thereby assumes Travelling and transport allowances are granted under the regulations of each dependency to officers who are required to travel on duty; and generous provision is made to assist, by means of advances, officers who wish to purchase motor-cars which will be of use to them in the performance of their duties

Quarters.—Free quarters, with heavy furniture, are provided (or allowances are paid in lieu) in all the East and West African dependencies and in Fiji and the Western Pacific Islands, and in the case of some appointments in Hong-Kong Government quarters for which officers are required to pay rent (which is usually calculated as a small percentage of salary) are normally provided in Ceylon, the Straits Settlements, and the Federated Malay States In the smaller dependencies Government quarters are not usually available

Marriage.—In general as few restrictions as possible are imposed on the employment of married officers in the Colonial Service Moreover, where conditions are suitable, married officers are encouraged to have their wives and children with them as much as possible.

Private practice.—No officer of the Colonial Medical Service is entitled, as of right, to private practice, the Service being envisaged as essentially one of whole time officials whose primary duty is to the State The conditions, if any, under which officers are permitted to engage in private or consulting practice, and to receive fees from members of the public, are determined by local regulations

Promotion and transfer.—Senior appointments are usually filled by promotion, and officers are considered by the Secretary of State for any vacancy for which they may be suitable and qualified whether the vacancy arises in the particular dependency in which they may be serving at the time or elsewhere An officer may be transferred to any post which is not of less value (due regard being had to climate and other circumstances) than that which he already holds

Leave.—Officers are as a general rule eligible for vacation leave with full salary, together with leave for the normal period occupied by the voyages between the dependency and the United Kingdom, after a tour of resident service which, within specified limits, is at the discretion of the Governor. Leave is, in most cases, calculated on the basis of a fixed number of days in respect of each completed month of resident service As an example, in West Africa the normal tour is 18 months and leave of 7 days is granted for each completed month of service In addition provision is made for sick leave which is usually granted with full salary up to a maximum of six months and if necessary with half salary for a further six months.

Passages.—Free passages from the United Kingdom on first appointment are usually granted for officers and, if they are married, for their wives and children, provided that the permission of the Government is obtained, if required, for the officer's wife and family to proceed to the dependency concerned; but the maximum number of passages paid for from public funds is limited to five When on leave free passages for officers and for their wives are normally granted once each way in respect of each tour In all dependencies except the West Indian Colonies, Seychelles, and West Africa assistance can under varying conditions be obtained towards the cost of passages for children.

PENSIONS

Pensions are granted under local laws, the provisions of which vary in detail The minimum period of service necessary to qualify for a pension is ten years If an officer retires after less than ten years' service, a gratuity *may be granted* Except in Bermuda, no deductions are made from salaries in consideration of the grant of pensions.

The normal rate of pension is 1/600th of final pensionable emoluments[1] for each completed month of service

In some dependencies an officer may elect within a specified period to be paid on retirement a reduced pension equal to three-quarters of the full pension he has earned, together with a gratuity equal to ten times the amount of the reduction In some other colonies—e g, in West Africa—this form of award is compulsory.

The normal retiring age is 55 except in the Bahamas, Barbados, Bermuda, and Jamaica, where it is 60 But officers may in most colonies be called upon to retire with the approval of the Secretary of State, or may elect to retire voluntarily at the age of 50.

In the majority of colonies there is provision for the grant to the legal representative of an officer who dies while in the Service, of a gratuity not exceeding one year's pensionable emoluments

Widows' and orphans' pensions.—In most dependencies officers, whether married or not, are required to contribute to local schemes which provide for the payment of pensions to widows and orphans Contributions vary but are generally 4 per cent of salary The schemes are subsidised by the colonial Governments concerned, and the pensions are based upon actuarial tables

Further information as to the staffs, the climate, and local conditions will be found in the Dominions Office and Colonial Office List which may be consulted in most public libraries. Leaflets concerning nearly all the tropical dependencies are issued for the use of intending settlers and others by the Oversea Settlement Department, Caxton House, Tothill-street, London, S.W.1. Information about general

[1] "Pensionable emoluments" means salary plus any other emoluments, such as the value of free quarters, which are pensionable under the local law.

conditions in Malaya is obtainable from the Malayan Information Agency, 57, Trafalgar square, London, W C 2

Applications for appointment to the Colonial Medical Service should be addressed to the director of recruitment (Colonial Service), Colonial Office, 8, Buckingham gate, London, S W 1, who will furnish without charge a memorandum containing full information regarding the Service

SUDAN MEDICAL SERVICE

This service is responsible for carrying out civil medical work and public health duties in the Sudan, and for the health of the Sudan Defence Force

The British staff consists of a director, 3 assistant directors (hygiene and public health, hospitals, laboratory services), a senior physician and a senior surgeon to the Khartoum Civil Hospital, a Government gynæcologist and obstetrician and a Government ophthalmologist, a medical officer of health, Khartoum Province, a bacteriologist, and a number of (at present 34) British senior medical inspectors and medical inspectors Medical inspectors are first appointed on probation for two years Pay commences at £720 and rises by five biennial increases to £1080, and after 13 years' service to £1200, with higher scales for the senior posts

The service offers a great variety of work among many different races Leave of 90 days is usually granted every year after the first 18 months of service, and study leave may be given for special purposes There is a pension and provident fund, the details of which may be found in the pamphlet of "Information for Candidates" Private practice is allowed but is limited to a few of the larger towns The duties include acting as consultant to the principal hospitals, the supervision of medical and public health work, the inspection of schools, the examination of candidates for Government service and pension, and the training of medical assistants and Sudanese sanitary officers and overseers The Khartoum medical school is staffed by members of the service, who receive additional remuneration for this work

Further information may be obtained from Dr H C Squires, C M G, 93, Harley street, London, W 1

SOUTHERN RHODESIA MEDICAL SERVICE

The Government maintains a medical and public health service in three categories (*a*) full-time appointments (11), (*b*) Government medical officers (25), who in addition to their Government duties supply in whole or in part the general practitioner service in all stations except the two larger towns, and (*c*) medical officers (13) who receive a subsidy of about £250–£360 a year and are mostly mine medical officers or medical missionaries

The full time appointments are as follows —

	Salary
Medical director and chief health officer	£1750
Directors of laboratories, Salisbury and Bulawayo	£1000–£1250
Radiologist Salisbury	
Medical superintendent mental hospital	
Field officer	
Male school medical officer	£800–£1000
Female school medical officer	£600–£900
Assistant medical officer mental hospital	£600–£750 plus £130 in lieu of private practice

Government medical officers on appointment are posted to Grade 2 at a salary of £600, rising to £750 a year Promotions are made as vacancies occur to posts in Grade 1 at salaries of £750–£1250 a year

Officers are usually entitled to private practice, the earnings from which range from £200 a year upwards Their duties include supervision of the Government hospitals (of which there are 13) and native clinics, medico legal duties, and medical supervision of gaols, police camps, and Government stations

Leave is granted at the rate of one eighth of service, and can be accumulated to six months at one time. After two years' service medical officers under 45 are eligible for appointment to the fixed establishment and contribute to a pension scheme The retiring age is 60

All appointments in Great Britain are made by the High Commissioner for Southern Rhodesia, Rhodesia House, 429, Strand, London, W C 2, who will supply further details on request

INDUSTRIAL APPOINTMENTS

Service with a big commercial or industrial corporation is well worth the consideration of those contemplating a medical career in the tropics Permanent and semi permanent employment is to be found on tea estates, rubber plantations, oil fields, and mines, and medical officers are also required temporarily on engineering works such as the building of bridges, barrages, and hydro electric schemes The British Medical Association has recently studied the position of this unofficial service and has, with the coöperation of the principal industrial concerns, drawn up a model form of contract as a guide both to employers and to medical men in arranging their contracts In consequence the conditions of service are generally satisfactory The average commencing salary is about £1000 a year with free quarters and certain allowances, rising to £2000, or even higher salaries Medical officers to estates or mines overseas are offered an interesting and varied field in which to practise their profession They have under their care a group of Europeans and a large labour force, and, in addition, are usually responsible for sanitation and for measures for the prevention of disease on their estates

INFECTIOUS DISEASE
IN ENGLAND AND WALES DURING THE WEEK ENDED AUG 12, 1939

Notifications —The following cases of infectious disease were notified during the week Smallpox, 0, scarlet fever, 1320, diphtheria, 720, enteric fever, 32 (50 "expected"), pneumonia (primary or influenzal) 317, puerperal pyrexia, 175, cerebro spinal fever, 21, poliomyelitis, 15, polio-encephalitis, 3, encephalitis lethargica 3 dysentery, 17, ophthalmia neonatorum, 68 No case of *cholera plague*, or typhus fever was notified during the week

The number of cases in the Infectious Hospitals of the London County Council on Aug 12 was 2330 which included Scarlet fever 527 diphtheria 498 (carriers, 17) measles 15 whooping-cough 619 puerperal fever 16 mothers (plus 9 babies) encephalitis lethargica, 302 poliomyelitis 20 At St Margaret's Hospital there were 10 babies (plus 5 mothers) with ophthalmia neonatorum

Deaths —In 126 great towns, including London, there was no death from smallpox or enteric fever, 3 (0) from measles, 7 (0) from scarlet fever, 11 (1) from whooping-cough, 14 (1) from diphtheria, 27 (5) from diarrhœa and enteritis under two years, and 8 (1) from influenza The figures in parentheses are those for London itself

Birmingham reported 2 deaths from whooping-cough 1 fatal cases of diphtheria were scattered over nine great towns Liverpool and Coventry each reporting 2 Liverpool had 2 deaths from diarrhœa

The number of stillbirths notified during the week was 207 (corresponding to a rate of 35 per 1000 total births) including 40 in London.

instruction If an officer has not taken a course of instruction in tropical medicine before appointment, he is usually required to take one during his first leave of absence

EMOLUMENTS

When considering the scales of salary offered in the Colonial Medical Service, candidates are particularly advised to consider the general conditions of service It will frequently be found that the actual value of an appointment is considerably greater than is indicated by the salary alone. For example, all scheduled appointments are pensionable; in most dependencies free quarters (or allowances in lieu) are provided, and in almost all, free medical attendance Passages are also, generally speaking, provided at Government expense when an officer proceeds on leave, for himself and his wife, and assistance is given towards the cost of passages for his children. In those colonies in which income-tax is payable, the rates are usually much lower than in the United Kingdom. At the same time, the cost of living in the dependency concerned should be taken into account in order to obtain a true comparison, *and candidates should therefore consult the handbook* "Information as to the Conditions and Cost of Living in the Colonial Empire" which is published by the Stationery Office at 3*s* 6*d*

Salaries vary in the different dependencies, and it is not possible to set them out here in detail The commencing rates range from £500 a year in Cyprus to £600 and £660 in Tropical Africa and £700 in Malaya and Hong-Kong. Most officers have a normal expectation of reaching £1000 a year or more by increments, subject only to efficiency, and there are many higher-grade, specialist, and administrative posts carrying salaries from £1150 up to £2000 a year The actual number of posts and rates of salary can be obtained from the director of recruitment at the Colonial Office.

GENERAL CONDITIONS OF SERVICE

Probation —Officers are normally appointed on probation in the first instance The period is usually two or three years, and officers whose service has been satisfactory are then confirmed in their appointments, their period of probation being counted as part of their pensionable service.

Acting and other allowances —An officer appointed to act in a higher post in the absence of the substantive holder of that post is usually granted an allowance in recognition of the additional responsibilities which he thereby assumes Travelling and transport allowances are granted under the regulations of each dependency to officers who are required to travel on duty, and generous provision is made to assist, by means of advances, officers who wish to purchase motor cars which will be of use to them in the performance of their duties.

Quarters —Free quarters, with heavy furniture, are provided (or allowances are paid in lieu) in all the East and West African dependencies and in Fiji and the Western Pacific Islands, and in the case of some appointments in Hong-Kong Government quarters for which officers are required to pay rent (which is usually calculated as a small percentage of salary) are normally provided in Ceylon, the Straits Settlements, and the Federated Malay States In the smaller dependencies Government quarters are not usually available

Marriage —In general as few restrictions as possible are imposed on the employment of married officers in the Colonial Service. Moreover, where conditions are suitable, married officers are encouraged to have their wives and children with them as much as possible

Private practice —No officer of the Colonial Medical Service is entitled, as of right, to private practice, the Service being envisaged as essentially one of whole-time officials whose primary duty is to the State The conditions, if any, under which officers are permitted to engage in private or consulting practice, and to receive fees from members of the public, are determined by local regulations

Promotion and transfer. —Senior appointments are usually filled by promotion, and officers are considered by the Secretary of State for any vacancy for which they may be suitable and qualified whether the vacancy arises in the particular dependency in which they may be serving at the time or elsewhere An officer may be transferred to any post which is not of less value (due regard being had to climate and other circumstances) than that which he already holds.

Leave —Officers are as a general rule eligible for vacation leave with full salary, together with leave for the normal period occupied by the voyages between the dependency and the United Kingdom, after a tour of resident service which, within specified limits, is at the discretion of the Governor Leave is, in most cases, calculated on the basis of a fixed number of days in respect of each completed month of resident service. As an example, in West Africa the normal tour is 18 months and leave of 7 days is granted for each completed month of service In addition provision is made for sick leave which is usually granted with full salary up to a maximum of six months and if necessary with half salary for a further six months

Passages —Free passages from the United Kingdom on first appointment are usually granted for officers and, *if they are married, for their wives and children*, provided that the permission of the Government is obtained, if required, for the officer's wife and family to proceed to the dependency concerned; but the maximum number of passages paid for from public funds is limited to five When on leave free passages for officers and for their wives are normally granted once each way in respect of each tour In all dependencies except the West Indian Colonies, Seychelles, and West Africa assistance can under varying conditions be obtained towards the cost of passages for children.

PENSIONS

Pensions are granted under local laws, the provisions of which vary in detail The minimum period of service necessary to qualify for a pension is ten years If an officer retires after less than ten years' service, a gratuity may be granted Except in Bermuda, no deductions are made from salaries in consideration of the grant of pensions

The normal rate of pension is 1/600th of final pensionable emoluments[1] for each completed month of service.

In some dependencies an officer may elect within a specified period to be paid on retirement a reduced pension equal to three-quarters of the full pension he has earned, together with a gratuity equal to ten times the amount of the reduction. In some other colonies—e g, in West Africa—this form of award is compulsory

The normal retiring age is 55 except in the Bahamas, Barbados, Bermuda, and Jamaica, where it is 60 But officers may in most colonies be called upon to retire with the approval of the Secretary of State, or may elect to retire voluntarily at the age of 50

In the majority of colonies there is provision for the grant to the legal representative of an officer who dies while in the Service, of a gratuity not exceeding one year's pensionable emoluments

Widows' and orphans' pensions —In most dependencies officers, whether married or not, are required to contribute to local schemes which provide for the payment of pensions to widows and orphans Contributions vary but are generally 4 per cent of salary The schemes are subsidised by the colonial Governments concerned, and the pensions are based upon actuarial tables

Further information as to the staffs, the climate, and local conditions will be found in the Dominions Office and Colonial Office List which may be consulted in most public libraries Leaflets concerning nearly all the tropical dependencies are issued for the use of intending settlers and others by the Oversea Settlement Department, Caxton House, Tothill-street, London, S W.1. Information about general

[1] "Pensionable emoluments" means salary plus any other emoluments, such as the value of free quarters, which are pensionable under the local law.

conditions in Malaya is obtainable from the Malayan Information Agency, 57, Trafalgar square, London, W C 2

Applications for appointment to the Colonial Medical Service should be addressed to the director of recruitment (Colonial Service), Colonial Office, 8, Buckingham gate, London, S W 1, who will furnish without charge a memorandum containing full information regarding the Service

SUDAN MEDICAL SERVICE

This service is responsible for carrying out civil medical work and public health duties in the Sudan, and for the health of the Sudan Defence Force

The British staff consists of a director, 3 assistant directors (hygiene and public health hospitals, laboratory services); a senior physician and a senior surgeon to the Khartoum Civil Hospital, a Government gynæcologist and obstetrician and a Government ophthalmologist, a medical officer of health, Khartoum Province, a bacteriologist, and a number of (at present 34) British senior medical inspectors and medical inspectors Medical inspectors are first appointed on probation for two years Pay commences at £720 and rises by five biennial increases to £1080, and after 13 years' service to £1200, with higher scales for the senior posts

The service offers a great variety of work among many different races Leave of 90 days is usually granted every year after the first 18 months of service, and study-leave may be given for special purposes There is a pension and provident fund, the details of which may be found in the pamphlet of "Information for Candidates" Private practice is allowed but is limited to a few of the larger towns The duties include acting as consultant to the principal hospitals, the supervision of medical and public health work, the inspection of schools the examination of candidates for Government service and pension, and the training of medical assistants and Sudanese sanitary officers and overseers The Khartoum medical school is staffed by members of the service, who receive additional remuneration for this work

Further information may be obtained from Dr H C Squires, C M G, 93, Harley street, London, W 1

SOUTHERN RHODESIA MEDICAL SERVICE

The Government maintains a medical and public health service in three categories (*a*) full time appointments (11), (*b*) Government medical officers (25), who in addition to their Government duties supply in whole or in part the general practitioner service in all stations except the two larger towns, and (*c*) medical officers (17) who receive a subsidy of about £250–£300 a year and are mostly mine medical officers or medical missionaries

The full time appointments are as follows —

	Salary
Medical director and chief health officer	£1750
Directors of laboratories Salisbury and Bulawayo	£1000–£1250
Radiologist, Salisbury	
Medical superintendent, mental hospital	
Field officer	
Male school medical officer	£800–£1000
Female school medical officer	£600–£900
Assistant medical officer, mental hospital	£600–£750 plus £130 in lieu of private practice

Government medical officers on appointment are posted to Grade 2 at a salary of £600, rising to £750 a year Promotions are made as vacancies occur to posts in Grade 1 at salaries of £750–£1250 a year Officers are usually entitled to private practice, the earnings from which range from £200 a year upwards Their duties include supervision of the Government hospitals (of which there are 13) and native clinics, medico legal duties, and medical supervision of gaols, police camps, and Government stations

Leave is granted at the rate of one-eighth of service, and can be accumulated to six months at one time After two years' service medical officers under 45 are eligible for appointment to the fixed establishment and contribute to a pension scheme The retiring age is 60

All appointments in Great Britain are made by the High Commissioner for Southern Rhodesia, Rhodesia House, 429, Strand, London, W C 2, who will supply further details on request

INDUSTRIAL APPOINTMENTS

Service with a big commercial or industrial corporation is well worth the consideration of those contemplating a medical career in the tropics Permanent and semi permanent employment is to be found on tea estates, rubber plantations, oil fields, and mines, and medical officers are also required temporarily on engineering works such as the building of bridges, barrages, and hydro-electric schemes The British Medical Association has recently studied the position of this unofficial service and has, with the coöperation of the principal industrial concerns, drawn up a model form of contract as a guide both to employers and to medical men in arranging their contracts In consequence the conditions of service are generally satisfactory The average commencing salary is about £1000 a year with free quarters and certain allowances, rising to £2000, or even higher salaries Medical officers to estates or mines overseas are offered an interesting and varied field in which to practise their profession They have under their care a group of Europeans and a large labour force, and, in addition, are usually responsible for sanitation and for measures for the prevention of disease on their estates

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUG 12, 1939

Notifications—The following cases of infectious disease were notified during the week Smallpox, 0, scarlet fever, 1820, diphtheria, 720, enteric fever, 52 (50 "expected"), pneumonia (primary or influenzal), 317, puerperal pyrexia, 175, cerebro-spinal fever, 21, poliomyelitis, 15; polio-encephalitis, 3, encephalitis lethargica, 3, dysentery, 37, ophthalmia neonatorum, 88 No case of cholera plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Aug 18 was 2530 which included scarlet fever 597 diphtheria 493 (carriers, 17) measles 15 whooping-cough 619 puerperal fever 16 mothers (plus 6 babies) encephalitis lethargica 302 poliomyelitis 26 At St Margaret's Hospital there were 10 babies (plus 5 mothers) with ophthalmia neonatorum

Deaths—In 126 great towns, including London, there was no death from smallpox or enteric fever, 7 (0) from measles, 3 (0) from scarlet fever, 11 (3) from whooping-cough, 11 (4) from diphtheria 27 (5) from diarrhœa and enteritis under two years, and 8 (1) from influenza The figures in parentheses are those for London itself

Birmingham reported 2 deaths from whooping-cough Fatal cases of diphtheria were scattered over nine great towns Liverpool and Coventry each reporting 2 Liverpool had 3 deaths from diarrhœa

The number of stillbirths notified during the week was 207 (corresponding to a rate of 35 per 1000 total births) including 40 in London

POST-GRADUATE STUDY

ALL the undergraduate medical schools throughout the country provide opportunities of more advanced study for their own graduates. Glasgow, for instance, has its own post-graduate association and several of the London schools hold post-graduate weeks at the beginning of October. Apart from these domestic arrangements there is now in London a fully equipped post-graduate school and some of the larger voluntary hospitals have for long organised regular post-graduate courses, while a number are available for special study of many kinds; the same applies to a less extent in the provinces.[1]

In London some 50 general and special hospitals work in conjunction with the Fellowship of Medicine and Post-Graduate Medical Association, which has its office at Room 28 in the House of the Royal Society of Medicine, 1, Wimpole-street, London, W.1. Arrangements are made for courses in medicine and in surgery and the specialties, occupying the whole or part of each day for periods of one to four weeks. Special evening clinical courses for the M R C.P. and F.R.C S (primary and final) examinations are organised at intervals. The membership fee is £1 1s. per annum, which includes the subscription to the monthly *Post-Graduate Medical Journal.*

For many years past a scheme has been in operation to provide courses of post-graduate study for insurance doctors in isolated rural areas Two years ago, in consultation with the Insurance Acts Committee of the British Medical Association, the scheme was widened to enable all doctors with substantial insurance practices to take a refresher course once every five years. Urban as well as rural doctors are eligible for a grant from the Ministry of Health which covers the whole cost of study and if necessary the payment of a substitute while the doctor is away from his practice. This year 29 refresher courses were held in ten provincial centres and 30 courses at the British postgraduate school at Hammersmith. The departments of health also arranged 3 courses in Scotland and 5 in Wales The average number of doctors attending a course is 20, so that about 1300 attended this year, as compared with some 800 last year. In addition to these intensive courses, which last a fortnight, the British postgraduate school arranged one extended course for London insurance practitioners on two afternoons a week; others on similar lines were held at Sheffield and in Kent, and next year there will be four more at other provincial centres.

BRITISH POSTGRADUATE MEDICAL SCHOOL

The school was opened by King George V on May 13th, 1935 It is situated in the grounds of Hammersmith Hospital (L C C) in Ducane-road. Ducane-road runs parallel to Western-avenue to the south of a large area of open ground known as Wormwood Scrubs which can never be built over. On the west lies the prison, and there is an extensive plot on the east, belonging to St. Clement Danes Grammar School, which will also remain open. The hospital grounds cover 14 acres and provide ample room for further building

The new block in which is housed the medical school consists of three floors around a central courtyard. It contains two lecture theatres, each with seating room for 100 students and a separate room for the cinema operator, a complete morbid anatomy and histology department, a library and museum and pathological and bacteriological laboratories. Additional laboratories and accommodation for professors have recently been provided.

The school is controlled by a board of governors made up of 19 representatives of various interested bodies under the chairmanship of Sir John Caulcutt. The school depends for its main income on grants from the Treasury. It is a recognised school of the University of London by which all appointments of professors and readers are made. It works in coöperation with the London County Council which provides the site of the school and the clinical facilities of Hammersmith Hospital, to which have been added a new surgical and maternity block and a large out-patient department. The staff of the school provides the bulk of the professional care of the patients in the hospital. The responsibility for the care of patients rests with the L C C, and although the proper duty of the school is teaching, the two functions of teaching students and treating patients are inseparable.

The work of the school is divided into five departments: medicine, surgery, obstetrics and gynæcology, pathology, and radiology. With the exception of radiology, the directors are professors of the University of London. They are assisted by readers and a varying number of assistants. These are all whole-time members of the staff and are not engaged in private practice There is also a visiting staff, who either take charge of wards for a time or give courses of lectures on their special subjects The school is open equally to men and women It provides for: (1) students from the Empire and abroad who wish to do post-graduate work; (2) newly qualified practitioners who are preparing for higher examinations or specialising in one of the above branches; (3) research students, who are given special facilities for their work; (4) it arranges courses for officers of H.M. Services, both for promotion and for special subjects; (5) short refresher courses for general practitioners The refresher courses are intended especially for insurance practitioners receiving assistance from the Ministry of Health, but the Ministry allows the school to enrol two non-panel practitioners in each class of 20. Each refresher course lasts a fortnight, and in the present year 30 courses are being organised. The subjects dealt with are those of most practical value to insurance practitioners Lecturers taking part in these courses include not only the school staff but also selected teachers from all the medical schools, and visits are arranged to other hospitals in London. Some of the courses are conducted in their entirety by voluntary hospitals without undergraduate schools.

Apart from the special courses, graduates who have the time available join the school for "*hospital* practice and tuition." Such students attend from 10 A.M. to 4 P.M. Clinics are held daily. Students have every opportunity of examining and studying cases under expert guidance, and of receiving tuition thereon. They also attend the regular conferences between the different departments and the radiological and pathological demonstrations, which are held weekly. A special course for the London University diploma in clinical pathology, lasting twelve months, has recently been arranged. The next course will start on Oct. 2nd.

[1] Information about post-graduate work of all kinds and in all places may be obtained from the Central Information Bureau of the British Postgraduate Medical School, at the London School of Hygiene, Keppel-street, London, W C 1.

The inclusive fee for ordinary students is at the rate of 6 guineas for one month, 9 guineas for two months, and 12 guineas for three months Further information about fees for special courses, lodgings, and about post graduate facilities in America and on the Continent can be obtained from the dean at the school or from the sub dean at the Central Information Bureau, which has recently been opened for the convenience of students in the building of the London School of Hygiene and Tropical Medicine, Keppel street, W C 1

SEAMEN'S HOSPITAL SOCIETY

The society possesses six establishments the Dreadnought Hospital at Greenwich, 257 beds, the Albert Dock Hospital, E 16, 55 beds with a fracture clinic and rehabilitation centre, the Hospital for Tropical Diseases, Endsleigh gardens, W C 1, 77 beds, Tilbury Hospital, Tilbury Docks, Essex, 94 beds, King George's Sanatorium for Sailors, Bramshott, Hants, 80 beds; and the Angas Home, Cudham, 30 beds The first and second house surgeons at the Dreadnought Hospital are recognised by the Council of the Royal College of Surgeons of England for the purpose of the Fellowship The London School of Clinical Medicine is attached to the Dreadnought Hospital Residential facilities for the observation of the practice of the wards, special departments, and pathological laboratory of the Dreadnought Hospital are available to ship surgeons upon the recommendations of their shipping company The clinical teaching of the London School of Hygiene and Tropical Medicine is given at the Society's Hospital for Tropical Diseases, Endsleigh gardens

RESEARCH

Medical Research Council

The Council maintains a central research institute, the National Institute for Medical Research, at present situated at Hampstead, and it has in its service a whole time research staff working there and at various other institutions throughout the country Clinical research units at several hospitals are wholly or largely maintained by the Council Temporary grants, either for the personal remuneration of investigators or for their research expenses, are made in respect of approved schemes of work in clinical and other aspects of medical science, and a system of post graduate studentships and research fellowships in clinical science and experimental pathology has been instituted to encourage young British medical graduates of special ability and original mind to undertake research Travelling fellowships in medicine are annually awarded by the Council on behalf of the Rockefeller Foundation of New York, and others restricted to the field of tuberculosis from a special benefaction for the purpose Junior and senior fellowships for research in tropical medicine are also awarded annually

Inquiries about grants, studentships, or fellowships should be addressed to the secretary, Medical Research Council, 38, Old Queen street, London, S W 1, from whom further particulars and forms of application may be obtained

Royal College of Surgeons of England

The Research Department consists of two sets of laboratories—the Bernhard Baron laboratories in the College building at Lincoln's Inn fields and the Buckston Browne surgical research farm These two units provide facilities for workers who desire to undertake investigations which will throw light on problems of surgical diagnosis and treatment and investigations in the field of medical science generally Although fellows and members of the College have first call on the facilities of the laboratories, workers who do not hold these diplomas are given facilities when accommodation is available

Application should be made to the director of research, Royal College of Surgeons, Lincoln's Inn fields, London, W C 2, stating qualifications, experience, and an outline of the proposed research When a worker is accepted he is allowed, if he so wishes, to reside at the research farm where a limited number of single rooms are provided Physiological equipment, X ray apparatus, histological facilities, and operation theatres are provided in each unit

The College offers a limited number of scholarships, and also provides funds to defray either the whole or a part of the expenses of approved researches Vacancies for research scholars are announced in the medical press, usually in the months of June or July.

GENERAL HOSPITALS

Royal Northern Group

The Royal Northern Hospital, Holloway, is the main institution of the group which includes the St David's wing for private patients (including a certain number of maternity cases), the Royal Chest Hospital, City road, Grovelands Hospital (recovery branch), Southgate, the Maternity Nursing Association, and the Reckitt Convalescent Home, Clacton on-Sea The total number of beds in the group is 484 At the Royal Northern the large rectangular and circular wards, each of which contains 25 beds, the maternity ward and children's ward for children up to 11 years of age, the observation wards in the casualty department, the six operation theatres, and out patient department are designed with a view to offer the greatest facilities for clinical work Demonstrations are given daily in the wards and out-patient departments Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments, and, may receive certificates at the end of their terms of office

Prince of Wales's

This hospital, situated in Tottenham, is in the midst of a densely populated neighbourhood, and contains medical, surgical, gynecological, and children's wards having 238 beds There are special departments for gynæcological cases, diseases of the eye ear, throat, and nose, skin diseases, medical electricity, radiography, and dentistry Operations are performed every afternoon of the week (except Saturday) and on Wednesday and Thursday mornings Clinical instruction is given in the wards and out patient departments, laboratories, and lecture hall in connexion with the North East London Post Graduate College attached There are six resident medical officers, and clinical assistants are appointed under certain conditions Special intensive post graduate courses are held at intervals

National Temperance Hospital

The hospital (Hampstead road, N W) contains 160 beds The medical and surgical practice of the hospital is open to students and practitioners Operations Monday, 10 30 A M and 1 30 P M, Tuesday and Wednesday 2 P M, Thursday, 9 15 A M, Friday 11 A M Out patient departments for the following classes of case have been opened dermatology, ophthalmology, oto rhino

laryngology, diseases of the chest and of the rectum. There are also an out-patient gynæcological clinic, a fracture clinic, and an artificial pneumothorax clinic.

Hampstead General and North-West London

The hospital at Haverstock Hill has 138 beds and embraces all acute general wards with a pathological department, extensive and up-to-date X ray and massage departments, with a casualty department and consultative out-patient clinics. The main out-patient department is at Bayham-street, Camden Town. Post-graduate lectures are held during the winter months free to medical practitioners Resident appointments · house physician, 2 house surgeons, casualty medical officer, casualty surgical officer.

Metropolitan Hospital

At this hospital in Kingsland-road there are 150 beds, including 17 for children. Operations are performed morning and afternoon daily. In the large out-patient department, in addition · to the usual general facilities, there are fracture clinics and special departments for neurological, ophthalmic, rectal, genito-urinary, ear, nose, and throat, skin, and dental cases, diseases of women, and electrotherapy. The services of an associate surgeon for neuro-surgery and for thoracic surgery are available There are also a V.D. clinic and a tuberculosis dispensary.

Queen Mary's Hospital for the East End

This hospital, which has developed from the West Ham and Eastern General Hospital, has 219 beds and ministers to a very poor public Founded as a dispensary in 1861, it has become a valuable charity with a full medical staff of physicians and surgeons, and specialists for gynæcology, obstetrics, ophthalmological surgery, radiology, dermatology, and dental surgery. The King George V operating theatre suite costing £20,000 was opened in 1938 The Fellowship of Medicine makes frequent use of its facilities. The pathological laboratory carries out investigations for other hospitals and for local authorities The resident staff consists of a resident medical officer, 2 casualty officers, 2 house physicians, 2 house surgeons, and 2 obstetric house surgeons

L.C.C. Hospitals

To Hammersmith Hospital is attached the British Postgraduate Medical School At St. Alfege's students for the final F.R C S. at Guy's can examine select cases under a surgical tutor. At St Andrew's a consultant surgeon holds weekly classes for two periods of about ten weeks before the same examination. The South-West London Post-Graduate Association has its headquarters at St. James' Hospital where three sessions of lectures are delivered annually in the autumn, spring and summer; in collaboration with the Fellowship of Medicine instruction is given in orthopædic surgery and special anæsthesia for plastic surgery. At the North-Western and Brook Hospitals lectures and demonstrations on clinical practice and hospital administration are given to candidates for the public health diploma, and courses in the modern methods of diagnosis and treatment of venereal diseases are held at the Whitechapel Clinic.

The majority of the general hospitals are recognised for qualification for candidature in branch 1 of the University of London M D. examination Eighteen of the general hospitals are recognised by the Royal College of Obstetricians and Gynæcologists for candidature for their diploma and membership Seventeen general hospitals are recognised by the Royal College of Surgeons of England for the purposes of the final fellowship examination and are also recognised for the purpose of the diploma in anæsthetics Appointments at Queen Mary's Hospital for Children, Carshalton, are recognised for the Conjoint Board's diploma in child health

Special departments for the treatment of various diseases have been established as follows —

Unit.	*Hospital*
Plastic surgery	St James'
Thoracic surgery	St Mary Abbots
Thyroid disease	New End
Radium and deep X ray therapy.	Hammersmith Lambeth
Urological diseases	St Mary, Islington St Mary Abbots
Rheumatism	St Stephen's
Vulvo-vaginitis and ophthalmia neonatorum	St Margaret's
Congenital syphilis in children	St John's
Surgery of cardiovascular diseases	Lambeth.
Foreign bodies in air-passages and upper food passages	St Giles'.
Diabetes	Mile End St Peter's St George-in-the-East
Out-patient psychiatric clinics	Mile End. St Charles' St Mary, Islington
Rheumatism in children	Norwood
Facial paralysis	St Olave's
Puerperal fever	North-Western
Poliomyelitis (infectious cases)	Western
Otological (infectious) cases	Southern
Congenital malformations in children	Queen Mary's, Carshalton
Post-encephalitis lethargica	Northern.
V D in women	Sheffield-street.

PSYCHOLOGICAL MEDICINE

Maudsley Hospital

The hospital contains 290 beds, of which 30 are in the children's wing and 60 in the private block. There is also a large out-patient department which deals with children and adults separately The clinical material covers practically the whole range of psychological medicine, but chronic or unwilling cases are not admitted to the wards, there are facilities for post-graduate students at the hospital to observe such cases by attending the practice of an observation ward in the district In the clinical unit the teaching and research are directed by the professor of clinical psychiatry and the clinical director. Facilities for gaining clinical experience or for carrying out research are open to qualified medical practitioners There is a vacancy every six months for two resident clinical assistants The clinical staff of the hospital consists of a professor, who is also the medical superintendent, a clinical director, 11 full-time physicians, 6 half-time physicians engaged in psychotherapy, and 2 in diagnostic work in the out-patient department There are also 4 fulltime workers in clinical research. With the hospital is associated the central pathological laboratory of the 16 mental hospitals (approximately 35,000 beds) of the London County Council, directed by the professor of pathology of mental disorder, with an established staff of four members, with research workers in all departments Grants-in-aid are available for approved research. A course of lectures and demonstrations for the diploma of psychological medicine is held annually from January to June. A period of clinical work at the hospital meets the requirements of the examining bodies in respect of practical study in psychological medicine.

Tavistock Clinic

The courses of training given at the clinic (The *Institute of Medical Psychology*) are intended for post-graduate students and those wishing to specialise in psychotherapy.

A systematic course of lectures is given from October to June The first part of this course (October to December) makes a complete introductory course in psychotherapy for those desiring an introduction to the subject For those wishing a more complete course, a systematic course of lectures of a more advanced nature is continued for the rest of the academic year Besides these the clinic provides a year's clinical course, with facilities for the advance study of and practice in the treatment of the psychoneuroses and early psychoses This course of clinical work and instruction is given under the personal supervision of senior members of the staff. It includes nine hours' weekly actual treatment of cases by the student There are also tutorials and case discussions The yearly clinical course is usually limited to twelve students This teaching is recognised by the University of London for the requirements of the post graduate diploma in psychological medicine (Regulation 3, part II, sections *d* and *e*)

A liaison with Hill End Mental Hospital and Clinic now exists, whereby those students taking the course at the clinic who have not had mental hospital experience may receive instruction and practice in psychiatry at that institution A series of ten clinical lectures on child psychology takes place on Thursday afternoons during April, May, and June, this is intended especially for school medical officers, members of the maternity and child welfare group of the Society of Medical Officers of Health, and others interested in work with children An intensive course of lectures on the psychoneuroses held annually in June is particularly intended for practitioners in the provinces who cannot attend the year's course A course on the neuroses in general medicine will be given during the year by leading specialists for general practitioners

Further information can be obtained on application to the educational secretary, The Tavistock Clinic, Malet-place, W C 1

Bethlem Royal Hospital

A course of lectures and practical instruction for the diploma in psychological medicine is held when possible at St Bartholomew's medical school and at Bethlem Royal Hospital twice annually, during the spring and autumn In addition to the above, clinical instruction in psychological medicine is given at the hospital every morning (except Wednesdays) at 11 A M House physicians are appointed for a term of six months in February May, August, and November in each year Clinical assistants are appointed from time to time for periods of three months or longer The physician superintendent at the hospital, Monks Orchard, Eden Park, Beckenham, will supply further particulars

TROPICAL MEDICINE

The Universities of Edinburgh and Liverpool grant diplomas in tropical medicine for which courses of instruction are given at their own schools (see p 522)

London School of Hygiene and Tropical Medicine

The course of instruction in tropical medicine and hygiene lasts five months and is designed to enable candidates to take the Conjoint Board's diploma in tropical medicine and hygiene, but members of the class may qualify for a school certificate at the end of four months

Two courses are offered annually, starting in October and March respectively The tuition fee is £40

NEUROLOGY

National Hospital, Queen-square

The hospital, with the convalescent home at East Finchley, contains 265 beds and cots The out-patient physicians attend every Monday, Tuesday, Wednesday, Thursday, and Friday at 2 P M, and the physicians on the same days Clinical clerks are appointed under physicians and clinical assistants to out patient physicians Post-graduate courses of lectures and demonstrations are held twice every year, usually commencing in January and October, and lasting about nine weeks Special courses in neurological ophthalmology, neuro-pathology, and the anatomy and physiology of the nervous system are given The pathological laboratory is available for special work under the pathologist

Maida Vale Hospital for Nervous Diseases

The hospital contains 85 beds including 20 private wards and 6 pay beds It is a neurological hospital, fully equipped for dealing with both surgical and medical cases with the following special departments massage, medical gymnastics, pathological, aural, dental, ophthalmic, X ray, psychological, psychiatric Monthly demonstrations are held for general practitioners and a monthly demonstration is given in connexion with the British Postgraduate Medical School Spring and autumn courses are held for the D P M in conjunction with the Maudsley Hospital course Two resident appointments, resident medical officer and house physician, fall vacant in May and November

West End Hospital for Nervous Diseases

The clinical and teaching facilities of this hospital of 76 beds (including 25 cots) fulfil the requirements of the examining bodies for the diploma in psychological medicine, and for the M D Lond At the out-patient department in Welbeck-street there are some 35,000 attendances in the year The general practice of the hospital is open to post-graduates and there are opportunities for personal examination of cases Systematic courses of instruction in neurology and in related subjects are held throughout the year, and special courses for the D P M and the M R C P Clinical demonstrations of psychological cases are given by members of the psychiatric department, with pathological discussions, special demonstrations upon child guidance, and the neurological aspects of various subjects, including radiology, ophthalmology, orthopædics, physical medicine, and oto-rhino laryngology Honorary clinical assistantships are available in the out patient department

HEART AND LUNGS

Royal Chest Hospital

The Royal Chest Hospital, City road, associated with the Royal Northern group of hospitals, has accommodation for 84 in patients and a large out-patient department, open daily Special departments include thoracic surgery, cardiology, laryngology radiology, electrocardiograph, massage and physical exercises, and an ultra violet light clinic Clinical assistants are appointed to work with the physicians in the out patient department Post graduate courses are held three or four times a year The tuberculosis dispensary for Islington south is attached to the hospital

Brompton Hospital for Consumption and Diseases of the Chest

The hospital contains 368 beds of which 57 are allocated to the surgical side and 98 to paying patients A further 150 beds are provided at the

sanatorium at Frimley, which also contains beds for paying patients The beds for paying patients at the hospital are so divided up as to provide wards of two and five beds each at a small inclusive fee, and single bedrooms in which the fees are non-inclusive. In addition to the resident medical officer there are 2 resident surgical officers appointed annually, an assistant resident medical officer, who assists in the artificial pneumothorax clinic, and 6 resident house physicians, whose duties include attendance at the out-patients' and special departments, and one of whom serves as assistant to the tuberculosis officer for Chelsea. These officers are appointed for a term of six months each. Post-graduates are admitted to the practice of the hospital Clinical assistants are appointed to the in-patient and out-patient physicians, the surgeons, and the special departments of the hospital Clinical demonstrations in the wards, the out-patient and special departments are given throughout the year, and two special medical and two special surgical post-graduate courses of one week each are held annually Special courses are also held every month except July for candidates for the M R C P. examination and for candidates for the final examination in medicine of the Conjoint Board.

London Chest Hospital

The hospital was founded in 1848, and is situated on the edge of Victoria Park. Accommodation: 190 beds (including private beds) for tuberculosis, non-tuberculous lung diseases, and cardiovascular diseases. There is a surgical block of 10 single bedrooms for major thoracic surgery. Special departments: surgical, laryngological, bronchoscopical, radiological, pathological, electrocardiographic Assistants are appointed to the clinics, and a limited number of research workers to the pathological department. The in-patient staff visit generally in the afternoon; out-patients at 2 P.M Graduates are admitted on payment of fees which entitle them to attendance at clinics, post-mortem demonstrations, and operations Special demonstration and lecture courses are provided. Graduates desiring assistantships in any department should apply to the dean Resident appointments comprise a resident medical officer, 3 house physicians, and a house surgeon. The first is a 12 months' appointment, the others 6 months. Applications for vacancies should be made to the secretary.

CHILDREN

Hospital for Sick Children, Great Ormond-street

The hospital was founded in 1852 and has the distinction of having been the first hospital for children only in the United Kingdom It is now being entirely rebuilt in accordance with the most modern principles, the ward block and laboratories being already completed. The new hospital contains 326 beds, of which 36 beds are for private patients. The out-patient department deals with over 30,000 new cases annually There are asthma, dental, rheumatic, venereal diseases, skin, aural, ophthalmic, and child guidance clinics, and X ray, electrotherapy, and massage departments. Clinical instruction is given daily by members of the staff; morning sessions 10 A M–12 noon, out-patients' clinics; afternoon sessions, 2–4 P.M, include ward visits and surgical operations The practice is open to students of both sexes who have completed four years' medical study and also to qualified medical men and women, who may attend for periods of one week upwards, the year being divided into three terms of approximately 13 weeks During these terms special lectures are given at the hospital weekly; details of these appear from time to time in the columns of this journal. Clinical clerks are appointed once a month, these appointments being open to fourth- and fifth-year students of recognised medical schools. Time spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge as part of the final curriculum. Facilities are available to post-graduates for obtaining theoretical and practical instruction in clinical pathology, bacteriology, and medical biochemistry in the laboratories *Resident appointments*: assistant physician; medical assistants and clinical pathologists (2), house physicians (4); surgical officer; house surgeons (3), aural registrar; anæsthetic registrar; medical officer, Tadworth Court The appointments are made for six months or one year.

Queen's Hospital for Children

This hospital, for sick children up to 14 years of age, was formerly known as the North-Eastern Hospital for Children. There are 167 beds in London (*Hackney-road, E.2*) and 44 at the seaside branch, Little Folks Home, Bexhill A rheumatism clinic in coöperation with L C.C schools is held twice weekly. There are massage, light, dental and psychiatric departments, and a special whooping-cough physician. The practice of the hospital is open to students by arrangements with the medical staff The following resident appointments are open to both men and women: senior medical officer; house surgeon, house physicians (2); casualty officers (3), including attachment to ear, nose, and throat, ophthalmic, and dermatological departments respectively.

Princess Elizabeth of York Hospital for Children

The hospital has 135 beds and is situated in Glamis-road, Shadwell Resident posts at the hospital are recognised by the Conjoint Board as fulfilling the necessary conditions for the diploma of child health Similar recognition is accorded to clinical assistantships at the hospital The number of these posts is limited to four. Resident posts at the hospital are recognised by London University as part of the requirements for the degree of M D. The hospital provides the usual special departments, including a rheumatism clinic and a special department for plastic surgery. Visitors and students are welcomed at ward rounds and in the out-patient department *Special intensive courses in pædiatrics* are held several times a year both in connexion with the Fellowship of Medicine and the British Postgraduate Medical School at Hammersmith Resident appointments are advertised periodically. These consist of one resident medical officer, one casualty officer, two house physicians, and one house surgeon. Holders of these posts are eligible for election to the Wander travelling fellowship, which is a reciprocity scheme by which one member of the resident staff at Shadwell each year is enabled to take an exchange post at the Children's Hospital, St. Louis, Missouri, U S A., for six months

MATERNITY

Queen Charlotte's Maternity Hospital

This hospital, formerly Queen Charlotte's Lying-in Hospital, is situated in Marylebone-road, and has 130 beds The hospital receives over 2900 patients annually, besides having a large out-patient department. Medical students and qualified practitioners are received at all times of the year. They have unusual

opportunities of seeing obstetric complications and operative midwifery on account of the very large number of primiparous cases—nearly one half of the total admissions Clinical instruction is given on the more important cases which present themselves They also receive valuable instruction in the antenatal and child welfare departments and postnatal clinics, where over 4000 patients attend yearly Special lecture demonstrations are given by members of the staff Pupil midwives are received and specially trained Courses in obstetric analgesia are also given to midwives A residential college provides accommodation for students and qualified practitioners (both men and women), and is opposite the hospital

The isolation block (30 beds) for puerperal fever and puerperal pyrexia, which has been built on the new site at Ravenscourt Park, Hammersmith, was opened in 1930, and the research laboratories, which adjoin this block, are in full working order Students may attend the clinics conducted by the staff at the isolation block, and demonstrations are also given at the research laboratories

The following resident appointments are made assistant resident medical officer (three months), proceeding to post of senior resident medical officer, (also three months), resident anæsthetist and district resident medical officer (six months), resident anæsthetist (three months)

City of London Maternity Hospital

This hospital, founded in 1750 and incorporated by royal charter in 1935, has kept pace with the advancement in medical and nursing science There are 71 beds (8 private) The training of pupil midwives has always been an important feature of the hospital's work for the community, and the thoroughness of this training is ensured by a highly qualified staff There are the following special departments antenatal clinics, three times weekly, remedial exercises clinic, once weekly, postnatal clinic and dental clinic, each once weekly, child welfare clinic (to which a pediatrician has been appointed), twice weekly, sunlight and radiant heat clinics The following special courses are available (*a*) Four months' intensive resident course for the midwife teachers' certificate (*b*) Two weeks' resident course in analgesics (*c*) Four weeks' resident post graduate course for practising midwives (*d*) Occasional week end (non resident) post graduate courses for general practitioners By arrangement with St Bartholomew's Hospital medical school a resident midwifery course is provided for 30 medical students each year (*e*) Six months' resident course in practical housekeeping There are two resident medical officers The junior post is held for three months, with a reversion to the senior post for a further three months

CANCER

Royal Cancer Hospital (Free)

The hospital, situated in Fulham road, S W, contains 127 beds The out patient department is open every week day, except Saturday, at 2 P M also Wednesday and Friday mornings at 10 and Saturday morning at 11 A course of study in physics and radiology, qualifying for the Diplomas in Medical Radiology of the University of London and the Conjoint Board is given The hospital is a recognised teaching school of the University of London in medical radiology, experimental pathology and pathological chemistry A resident medical officer is appointed for 12 months at £200 per annum, and senior and junior resident house surgeons are appointed for 6 months at a salary of £50 Non-resident assistants are appointed in the radiological department for 12 months at salaries of £350

Mount Vernon Hospital

The hospital contains 130 beds for cancer cases It possesses a fully equipped radiological department and extensive research laboratories Much original work is being carried out in its physics department There are facilities for post-graduate instruction Resident appointments are for a period of six months Clinical demonstrations are given by the visiting surgical staff Clinical assistants are appointed to surgeons in the wards The out patient and follow-up departments are at 3, Riding House street, W

Marie Curie Hospital

This hospital, which is officered by medical women, is a centre for the radiological treatment of women suffering from cancer and allied diseases The in-patient department contains 39 beds, of which 8 are for private patients There is a daily out-patient clinic to which cases are sent for diagnosis and at which those already treated are kept under observation The hospital has departments for radium and deep X ray therapy, and for X ray diagnosis The pathological department contains laboratories for clinical and experimental research The practice of the hospital is open to qualified medical visitors, and one graduate wishing to study the subject of radiology is accepted for full time service for three to six months A resident medical officer is appointed every three to six months

OPHTHALMOLOGY

Royal London Ophthalmic Hospital

The attendance at Moorfields Eye Hospital in City road is now very large There are 200 beds Operations are performed each morning and four surgeons attend daily Special courses of instruction are given, which extend over a period of five months, by members of the surgical staff and certain outside lecturers, beginning in October and March The instructions and classes are arranged to meet the requirements for the various diplomas in ophthalmology Students of the hospital are eligible as house surgeons, out patient officers, and clinical assistants The senior resident officer and three house surgeons are appointed every six months Twenty-four out-patient officers are appointed each year Clinical assistants are appointed every three months

Royal Westminster Ophthalmic Hospital

Founded by Guthrie, an army surgeon, in 1816 to treat eye diseases which were increasing after the return of the armies from the Napoleonic Wars this hospital, now situated in High Holborn, in a modern building with well equipped medical school has 100 beds (including 14 for paying patients) and a large out patient department The practice of the hospital is open to both men and women practitioners and students of medicine, who can prepare if desired for the higher diplomas in ophthalmology Post-graduate students of the hospital are eligible for the appointments of resident house surgeon (3), refraction officer (8), and registrar, all of which are paid and senior and junior clinical assistant (unpaid) A scholarship of £100 is awarded annually for research work Clinics are held in the afternoon at 1 30 P M. and on Friday evenings at 5 P M Operations are

performed daily in the theatres from 2 30 P M. Classes for the D.O.M.S. (Parts 1 and 2) are held in winter and summer sessions The next classes start in October. The orthoptic department, in addition to its training of orthoptic students, holds short courses of instruction at intervals for practitioners specialising in eye work.

Royal Eye Hospital

There are 55 beds at this hospital in St. George's-circus, Southwark, and an annual attendance of nearly 80,000 out-patients There is a well-equipped library and museum. The research department includes a contact lens clinic and ultra-violet radiation department. Special classes held in May and October are planned to meet the requirements of students preparing for the D.O.M S and similar examinations. Clinical classes in medical ophthalmology are held for candidates for the M.R C P examinations A course suitable for general practitioners is held in April under the auspices of the Fellowship of Medicine. There are 3 resident house surgeons, 35 clinical assistants, 20 refractionists, and 3 officers in charge of the squint training clinics A research scholarship in ophthalmology of £100 per annum is awarded yearly.

Central London Ophthalmic Hospital

This hospital, in Judd-street, St Pancras, has 51 beds, and clinical teaching is given daily Special departments include one for research into and development of the corneo-plastic surgery of the eye, a contact lens centre, and an orthoptic department for the treatment of squint. Voluntary hospital ophthalmic clinics are held on Mondays, Wednesdays, and Thursdays at 4 30 P M.

EAR, NOSE, AND THROAT

Central London Throat, Nose, and Ear Hospital

This hospital in Gray's Inn-road, with recovery home at Ealing (104 beds), is open daily to qualified medical practitioners on presentation of a visiting card. Demonstrations are given daily by the chief surgeon of each clinic and in the operating theatre. There is a whole-time clinical tutor. There are three vacancies for house surgeons annually, appointments being for nine months. Clinical assistantships, of which there are many, afford the best opportunities of actually handling instruments and dealing directly with patients Twice yearly a "general practitioners' week" is arranged, when the teaching work is restricted to that likely to be most helpful to those engaged in general practice

Comprehensive courses, each lasting five months, begin on Jan. 1 and June 1 They include anatomy and physiology (including facilities for dissection), pathology and bacteriology, radiology, endoscopy, speech therapy as well as lectures and demonstrations by representative members of the specialty other than those on the staff of this hospital and school. The courses are especially suitable for those intending to take the D.L O. (R C P & S.) or the F R C S E. with oto-rhino-laryngology as a special subject.

Golden-square Throat, Nose, and Ear Hospital

The hospital (101 beds), which has absorbed the London Throat Hospital, is situated in Golden-square, near Piccadilly Circus It was founded by Sir Morell Mackenzie in 1862 and is the largest special hospital of its kind in Great Britain. Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 4 P.M., and on Tuesdays and Thursdays from 6.30 to 8.30 P.M. There is an annual out-patient attendance of 35,000. Minor operations are performed on Mondays and Wednesdays at 9.30 A M Practitioners and post-graduate students are admitted to the practice of the hospital, and clinical assistants are appointed.

Metropolitan Ear, Nose, and Throat Hospital

This is the oldest ear, nose, and throat hospital in the world, having been founded by James Yearsley in 1838 The hospital is in Fitzroy-square and contains at present 22 beds, but extensions are at present in progress In future the hospital will contain 52 beds, with the most modern accommodation for post-graduate students The hospital is recognised for the D L O. The out-patient department is opened daily at 2 P M, Saturdays 1 P.M., to medical practitioners and senior students Operations upon in-patients are performed four days a week at 10 A M. Clinical assistants are appointed.

ORTHOPÆDICS

Royal National Orthopædic Hospital

This institution, situated in Great Portland-street (490 beds), is a good example of the fusion of scattered activities for the creation of an effective whole The three orthopædic hospitals of the metropolis were combined for the formation of this central institution at the instance of King Edward's Hospital Fund, with the result that the grants from this fund and the income from subscriptions can now be used to far better purpose and with economy. The hospital has also been approved by the Ministry of Health for the treatment of surgical tuberculosis, the connexion between orthopædics and the therapeutics required in many forms of tuberculosis having become obvious. Country branch at Brockley Hill, Stanmore (320 beds). Both branches of the hospital are residential schools for physically defective children, certified by the Board of Education. The hospital provides also a convalescent branch at Stanmore for 44 children and a residential training college for 112 cripples aged 16–22 A post-graduate course of 14 days is held about March each year. The out-patient department is open every week-day, except Saturday, at 1.30 P.M. The evening clinic on Tuesdays from 6 P M. to 8 P.M.

GENITO-URINARY AND RECTAL DISEASES

London Lock Hospital

At this hospital and home are 64 beds for women and children, with special departments for ophthalmic and maternity cases, and for female defectives Male out-patients are seen at 91, Dean-street, Oxford-street, daily from 10 30 until 7; female out-patients and children at 283, Harrow-road, Paddington, from 9 until 8. Special courses of lectures are given in May and November by arrangement with the Fellowship of Medicine. A limited number of practitioners and students can, on application to the dean, attend the hospital practice.

All Saints' Hospital

Founded in 1911 and now at Austral-street, West-square, St George's-road, S.E , this hospital for the treatment of genito-urinary diseases has 55 beds in general and private wards (some temporarily closed) Courses (free) for panel and other practitioners, held during the first week in each month, include cystoscopy and endoscopic methods with special demonstrations in radiography and clinical pathology. Out-patient

clinics at 2 P M on week-day afternoons are open free to practitioners There is a new and completely equipped X ray department

St. Paul's Hospital

This hospital in Endell street, Holborn, has 33 beds, 10 being for private patients and 4 for women It specialises in diseases of the kidneys, bladder, prostate, stricture, stone, and skin affections Out patients are seen every week day afternoon, cystoscopy sessions on Tuesday, Thursday, and Friday mornings; skin cases are seen at 9 A M on Mondays and Fridays The operating days are Mondays, Wednesdays, and Fridays in the afternoon Registered medical practitioners and students are invited to attend any branch of the work

St Peter's Hospital

This hospital for stone in Covent Garden invites practitioners and students to attend its out patient practice, the Friday (9 30 A M) clinic for women and children alone being open to medical women Special fortnightly courses in January, May, and November are arranged by the Fellowship of Medicine

St Mark's Hospital

Founded in 1835 in City road, E C, for the treatment of cancer, fistula, and other diseases of the rectum, this hospital has 63 general and 9 private beds The pathological department and the museum have been enlarged recently and a second operating theatre has been added Practitioners and students are invited to clinical instruction in the wards and out-patient department Operations on week-day afternoons (except Wednesday) at 2 P M Three weekly courses are held during the year in coöperation with the Fellowship of Medicine

SKIN

London School of Dermatology

This school of dermatology is based on St John's Hospital for Diseases of the Skin, with an in-patient department (40 beds) at 202, Uxbridge-road, W, and out patient clinics, at 5, Lisle street, W C 2, are held daily at 2 and 6 P M (Saturdays at 9 30 A M only), when demonstrations are given on the cases presenting themselves The Chesterfield Lectures, constituting a systematic course in dermatology, are given on Tuesdays and Thursdays at 5 P M, during October and November and January and February, by the staff of St John's Hospital and the physicians in charge of the dermatological departments of the London teaching hospitals The lectures are free to those attending the practice of the hospital and to registered medical students At the end of the course an examination is held for the Chesterfield medal in dermatology, open to all medical practitioners A summer course of lectures is also held four times weekly at 5 P M during the month of May each year The electrical department is open, Monday to Friday inclusive, from 2 to 7 P M Laboratory courses in the pathology and bacteriology of the skin can be arranged

DENTISTRY

REGISTRATION on the Medical Register entitles a practitioner to practise dentistry, although he cannot register as such without degree or licence in dentistry, but few dental appointments at general or special hospitals or dispensaries are available save to those with a special diploma, and, until registered on the Dentists Register, no dental work under the additional benefit scheme of the National Health Insurance Act can be undertaken

The examining bodies in dentistry which grant degrees and diplomas in the subject are as follows Royal College of Surgeons of England, Royal College of Surgeons, Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow, Royal College of Surgeons in Ireland, and the following universities Birmingham, Bristol, Durham Leeds, Liverpool, London, Manchester, Sheffield, St Andrews, Dublin (Trinity College), Queen's University of Belfast and the National University of Ireland The student should apply to the secretaries of the various Conjoint Boards or to the deans of the medical faculties or medical schools for a syllabus

A graduate in dental surgery (M D S or B D S) of a recognised university in the United Kingdom will in future be admitted direct to the second and final examinations of the Royal College of Surgeons of England

TEACHING INSTITUTIONS IN LONDON

Royal Dental Hospital

The Royal Dental Hospital of London, School of Dental Surgery, Leicester-square, is a school of the University of London A chair in dental surgery and pathology has recently been instituted The school provides the special dental education required by the University of London for the B.D S degree and by the Royal College of Surgeons for the licence in dental surgery The general part of the curriculum may be taken at any general hospital There is an in patient department of ten beds where the students attend as dressers Pupils are received for the training in dental mechanics recognised by the curriculum The instructor at the beginning of each session gives a course of lectures on operative dental surgery The two senior house surgeoncies and the six house surgeoncies are held for four months each and are open to all qualified students The lecturers give special demonstrations on the microscopy of dental anatomy and dental surgery The lecturer on dental mechanics also gives practical demonstrations in the laboratory Post graduate instruction can be arranged in any branch of dental surgery There are four entrance scholarships of £50 per annum for two years, in chemistry, physics, biology, and general knowledge, and four scholarships of £25 per annum for two years in dental prosthetics and dental anatomy

University College Hospital Dental School

This hospital and school, situated at the corner of Great Portland and Devonshire-streets, W, has been thoroughly reorganised, and is now fully equipped with the most modern appliances Students are entered as students of University College Hospital, and, as such, attend the classes of anatomy and physiology in University College, which is a few minutes' walk from the dental department in Great Portland street hitherto known as the National Dental Hospital—the first dental school to admit women students Practical courses to comply with the R C S curriculum are held Clinical lectures and

demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator.

Guy's Hospital Dental School

Dental students have the opportunity of attending at this hospital the whole course of instruction required for the B.D S. Lond. or L D S Eng.—viz, the complete course in dental prosthetics, the special lectures and practice of the dental department, and the general lectures and practice of the medical school. Students who enter for a medical as well as a dental course must obtain a degree or licence in dental surgery before commencing the clinical period of their medical course There is ample accommodation for extractions, both with general and local anæsthetics. The conservation room affords accommodation for about 100 dental chairs, with equipment of the most modern type for the use of the dressers, who, under the supervision of the staff, perform the various operations of dental surgery. There is a separate department for denture patients affording accommodation for 15 chairs, and also a special department for children with accommodation for 20 chairs. Instruction is given in operative dentistry on a "manikin" to students during their first three months of clinical study by the staff demonstrators. Students in dental prosthetics are occupied with this subject for two years, during which time a graded, systematic, and full course of instruction is given under the supervision of the professor of dental prosthetics, assisted by five demonstrators, a house surgeon, and skilled mechanics.

The following appointments are held by students: full surgeon's dresser, assistant surgeon's dresser, dresser in the children's department, casualty dresser, dresser to the professor of conservative dental surgery, probationary dresser, clerk to the anæsthetist, and dresser in the general anæsthetic and local anæsthetic rooms.

Two *entrance scholarships* are awarded annually in April as follows: (1) War memorial scholarship in arts of £40 per annum for four years, open to students under 19 years of age. Candidates are required to take English and any two of the following subjects: French, German, Latin, Greek, and mathematics. (2) Science scholarship of £40 per annum for four years, open to students under 20 years of age Candidates are required to take two of the following subjects: chemistry, physics, and biology.

Each year 19 house surgeons, 20 assistant house surgeons, and 4 student demonstrators of dental histology are appointed.

King's College Hospital Dental School

The dental school is part of the medical school of King's College Hospital, and was opened in November, 1923 The dental out-patient department of the hospital is used for the performance of dental extractions. A large conservation room with 40 dental chairs has been equipped Smaller rooms are used for clinical teaching and administrative requirements, and a specially equipped laboratory for training in dental mechanics An X ray apparatus has been installed for use in dental skiagraphy. The dental museum contains a large number of specimens illustrating oral, buccal, dental, and other diseases. The library, lecture theatre, lecture rooms, common rooms, and the refectory are all available for the use of students Courses of study, including practical work, are provided for the degree of bachelor of dental surgery of the University of London, and for the diploma in dental surgery of the Royal College of Surgeons of England. Special arrangements can be made for those students who wish to take a medical degree or qualification in addition to a degree or diploma in dental surgery

The following salaried appointments are open to qualified members of the school: registrar, resident house surgeon, non-resident house surgeons, and tutors in dental mechanics, operative dental surgery, and dental materia medica.

London Hospital Dental School

The dental school at the London Hospital is not a separate organisation but an integral part of the hospital and medical college. The policy of the board of management is to maintain a well-equipped and efficient dental department working in close coöperation with all the departments of the hospital and the medical college. Dental students mix with medical students and are encouraged to become as familiar as possible with general medicine and surgery. Those who can afford it are advised to take both medical and dental qualifications. The dental department of the hospital is equipped with all the necessary modern apparatus for dental work. There is a mechanical laboratory where approximately 500 dentures are constructed by students every year for hospital patients under the supervision of an expert instructor. Last year over 6700 new patients were treated in the hospital by the dental surgeons and their dressers, and the total number of attendances of patients in the dental out-patient department was nearly 26,000. The school therefore affords every opportunity for a student who wishes to gain a sound training in the practice of clinical dental surgery.

The number of students admitted to the school every year is strictly limited so as to ensure that all students shall have an adequate number of patients, and that classes, lectures, and demonstrations shall not be overcrowded.

Dental students share the laboratories in the Medical College with medical students, and special courses are arranged for them by the professors in anatomy, physiology, and pathology. In the Medical College there is a library well equipped with textbooks and dental periodicals, and a common room and dining-room so that students can get lunch and tea without leaving the building. Dental students enjoy all the same social and athletic privileges as medical students, and all the clubs and societies are open to them. A residential hostel provides accommodation for 78 dental and medical students. The Francis Farmer entrance scholarship of £25 in chemistry, physics, and biology is offered every year, and there are a large number of prizes for competition during the different stages of a student's training.

Application for admission should be made to the dean, from whom all further particulars can be obtained.

TEACHING INSTITUTIONS OUTSIDE LONDON

Birmingham Dental Hospital

This hospital was founded in 1858 and the present buildings, erected in 1903, are centrally situated in Great Charles-street. In 1931 there was substantial modernisation and reconstruction of many of the departments, to cope with the increasing numbers of patients. There is accommodation for approximately 100 students The institution serves a wide area in the midlands, and in general this area is regarded as one offering good opportunities to the

recently qualified The hospital, like the great majority of dental hospitals, is without beds at present, but the committee has approved plans for a completely new hospital to be erected at the Hospitals Centre adjoining both the Queen Elizabeth Hospital and the medical school, recently opened by the King and Queen, by this means bed accommodation will soon be available together with other special facilities for the institutional practice and teaching of dental surgery A clinic for the treatment of casualties and for simple extractions will be retained in the centre of the city

Undergraduate instruction is under the control of the professor of dental surgery at Birmingham University and the dean of the dental school, aided by the honorary staff, the demonstrators, and various members of the stipendiary staff Specialised post-graduate courses are arranged Appointments to the stipendiary staff open to students who have graduated are the house surgeonships (for periods of three months, with opportunity for reappointment) which are advertised in the local and professional papers

Leeds University School of Dentistry

The school of dentistry is adequately equipped to provide for the complete training of the dental student It forms a part of the Leeds school of medicine whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital The school is now in occupation of a spacious new building especially designed to the requirements of modern dental teaching The school is also the dental department of the General Infirmary, and its close association with the work of that institution ensures an adequate supply of clinical material, and enables a fuller insight into the position dental surgery holds in relation to general medicine and surgery, especially with regard to the major diseases and injuries of the head and neck The courses of study are mainly designed to meet the requirements of the B Ch D and L D S Leeds but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies Full time teachers give the instruction in clinical dental surgery, prosthetic dentistry, and mechanics, which is carried out under the supervision and direction of the professor of clinical dental surgery and members of the honorary staff Special facilities are provided for instruction in orthodontics, radiography, local and general anæsthetics, and bacteriology Prizes are offered for competition to students in their respective years of study Post graduate clinical courses are arranged in collaboration with the Dental Board of the United Kingdom, and facilities exist to meet the requirements of dental surgeons desirous of obtaining special post graduate instruction

Liverpool University School of Dental Surgery

Students taking courses in dental surgery in the University of Liverpool should take the dental degree (B D S) or licence (L D S) of this university, for which the courses are specially designed, but complete arrangements are also made for students desirous of preparing for the examinations of other licensing bodies Courses of instruction for the whole of the dental curriculum are provided in connexion with the faculty of medicine of the university Students of dentistry take some subjects in the medical curriculum in the same classes as students of medicine, and all the necessary classes in the special subjects of their own curriculum are provided in the university and at the dental hospital The dental school is a modern building and comprises an extensive dental laboratory, dental mechanics demonstration room, operative demonstration theatre, phantom demonstration room, dental, histological, pathological, bacteriological research, and photographic departments, parodontal department, and the offices of the director of dental education The dental hospital, situated in Pembroke place, adjoins the dental school, the university, and Royal Infirmary The ground floor contains a large waiting hall, examination room, extraction and anæsthetic rooms (with special waiting and recovery rooms for each) The first floor contains a large lecture hall, library, museum, and prosthetic department, with special laboratories, and a radiographical department The mezzanine floor contains orthodontic department, oral surgery, operating theatre, staff room, nurses' room, and offices The whole of the top floor is devoted to conservation work, it is lighted entirely from the north, and contains 50 pump operating chairs, brackets, and electric light

Manchester University School of Dental Surgery

Courses of study are provided to meet the requirements for the B.D S degree and the L D S diploma of the University of Manchester, and for the L.D S diploma of the Royal College of Surgeons of England At the Dental Hospital instruction is given in practical dental mechanics, operative dentistry, diagnosis and extraction, orthodontics, dental prosthetics, anæsthetics, and radiography by specially appointed clinical teachers All the courses of instruction are open to women students

Sutherland Dental School and Newcastle-on-Tyne Dental Hospital

The dental department is a component part of the medical school, King's College, Newcastle-on-Tyne, in the University of Durham The Dental Hospital and school, erected within the grounds of the Royal Victoria Infirmary, were opened in 1932 The buildings include lecture and class-rooms, museum, research laboratories, conservation and demonstration rooms (provided with Ritter electric units for the use of each student), operating theatre with preparation and recovery rooms, an extraction department, and X ray apparatus. There is also a mechanical laboratory where the whole of the practical training in dental mechanics may be undertaken and there is abundant material for clinical teaching in the Dental Hospital, the attendances of patients being over 32,000 annually Training in general medicine and surgery is provided in the Royal Victoria Infirmary and systematic lectures are given in the medical and dental schools A scholarship fund of £5000 is available for research in dental science

There are various prizes for students in their respective years, and the Dental Board of the United Kingdom recognises the school for the purpose of granting its bursaries to students

The total tuition fees for the B D S are £225 and for the L D S £165 including in each case the fee for dental mechanics These fees include £35 for the first year preinedical course In addition there are incidental fees for the students' union, library &c amounting to about £35 for the B D S and £30 for the L D S The examination fees including the preinedical examination, amount to £20 for the B D S and £14 for the L D S There are three college hostels in Newcastle and students may

reside in any one of them at a cost of approximately £2 per week.

Students proceeding to the L.D.S. are required to conform to the preliminary requirements of the General Medical Council and candidates for the B.D.S. must also satisfy the matriculation requirements in the same manner as medical students in the University.

The higher degree of *Master of Dental Surgery* (M.D.S.) is open to bachelors of dental surgery of the University of not less than two years' standing who present a thesis embodying original work and research in some subject connected with dentistry. Candidates may also be required to present themselves for clinical, practical, oral, and/or written examinations

Sheffield University School of Dental Surgery

The school consists of a department of dental mechanics within the university, Western Bank, and departments of the faculty of medicine in which teaching of the preliminary medical subjects of biology, anatomy, and physiology is carried out; the clinical dental department is housed in the out-patients' block of the Sheffield Royal Hospital. The department of metallurgy is one of the foremost in the country and a special course is arranged for dental students Courses are primarily designed to meet the requirements for the Sheffield University degrees and diploma, but every opportunity is given to students reading for the degrees and diplomas of other licensing bodies All courses are open to men and women alike. The department of dental mechanics has been re-equipped and extended and the teaching reorganised under the supervision of a full-time qualified instructor and his assistants

Despite the fact that the number of entries to this school has almost doubled in the last few years, it still ranks as one of the smaller schools and is therefore able to offer greater facilities for individual tuition, and students are afforded the opportunity of familiarising themselves in the use of modern equipment and materials.

Clinical teaching is carried out under the supervision and direction of the professor of dental surgery and members of the honorary staff who attend the department daily. The close association and coöperation between this department and the medical, surgical, and special departments of the Royal Hospital is of extreme value in fostering the correct relationship between the dental surgeon and his medical colleague All branches of clinical dental surgery are included in the curriculum, including special instruction in radiology, local anæsthesia, general and prolonged anæsthesias, orthodontia, porcelain work, and oral surgery, while special courses for dental students are held in the subjects of medicine, surgery, pathology, and bacteriology, with specially arranged out-patient attendance and intensive practical courses

Hostel accommodation is available for men and women students, and a new Students' Union permits students to take part in the many social activities of university life.

SCOTTISH TEACHING INSTITUTIONS

Edinburgh Dental Hospital and School

The Edinburgh Dental Hospital and school, which is the second largest in the United Kingdom, offers special advantages to dental students. The general courses required for the dental diploma are taken in the school of medicine of the Royal Colleges and clinical instruction in medicine and surgery is taken at the Royal Infirmary. The school of medicine and the Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. Instruction in dental hospital practice and in the mechanical laboratory affords a student ample opportunity for a full acquaintance with every branch of dentistry. The practice and lectures of the hospital are recognised by, and qualify for, all the licensing boards. Those students who desire to take a medical qualification in addition to the dental diploma have in this school admirable facilities for so doing The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The combined courses (medical and dental), which are held concurrently, may be completed in a minimum time of six years The higher dental diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration

Glasgow Dental Hospital and School

This hospital is located at 211, Renfrew-street, Glasgow. The school is open to men and women students and lectures are given on dental surgery, operative dental surgery, orthodontia, dental anatomy and physiology, dental histology, dental mechanics, crown and bridge work, dental metallurgy, dental bacteriology, radiology, anæsthetics, and dental materia medica Lectures on general subjects required for dentistry may be taken at the University or at one of the extramural schools where special provision is made for dental students The new Dental Hospital is now open and is equipped with all the modern methods for teaching students The Muirhead scholarship of £150 for one year enables a woman graduate to study for the higher dental diploma (H.D.D. Glasg), and the Muirhead bursary of £60 per annum for four years enables a woman student to obtain the L.D.S. of the Royal Faculty of Physicians and Surgeons, Glasgow. A Dall research scholarship is open to men and women

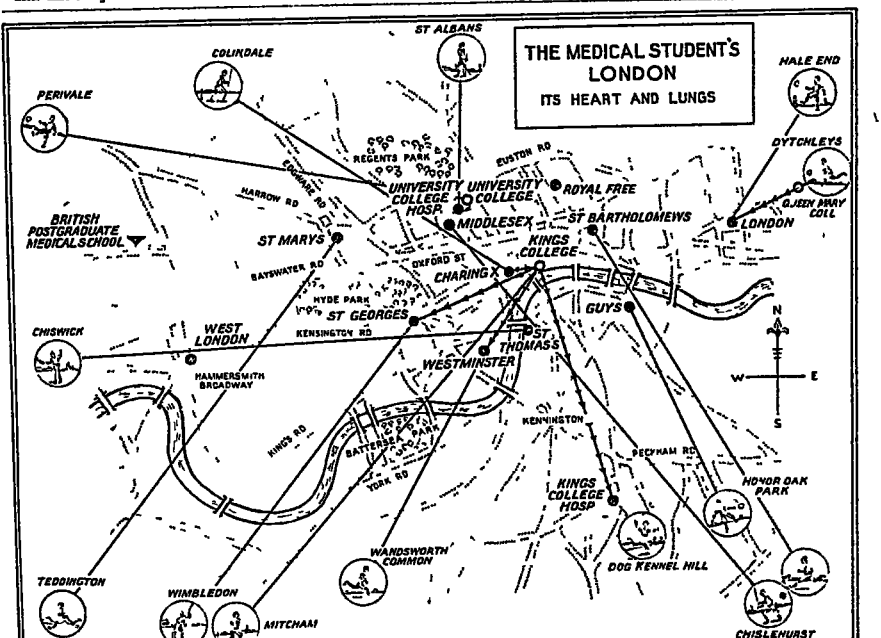
Glasgow Royal Infirmary Dental Department

The following course in the curriculum can be taken at St. Mungo's College: anatomy, six months; practical anatomy, nine months; physiology, six months; chemistry, six months; practical chemistry, three months; surgery, six months; medicine, six months; materia medica, three months Clinical medicine (three months) and clinical surgery (six months) are taken at the Royal Infirmary

IRISH TEACHING INSTITUTIONS

Dental Hospital of Ireland

All dental students, male or female, who have passed their second dental examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the clinical instruction of the hospital The winter session begins in September Clinical instruction is given daily by the visiting staff and demonstrators Lectures are given in the following subjects: dental surgery and pathology, mechanical dentistry and prosthetics, dental anatomy, dental materia medica, anæsthetics, and orthodontics. Practical dental mechanics can be taken in the hospital laboratory Post-graduate courses are given in orthodontics



This picture of the medical student's London would be incomplete without a reminder that for the purpose of clinical teaching the general hospitals of the London County Council are affiliated to the various schools as follows —

Council's Hospital	*Medical School*	*Council's Hospital*	*Medical School*
St Charles	Charing Cross	Hackney Bethnal Green	St Bartholomew's
St Alfege's St Mary Abbots St Olave's Lewisham	Guy's	St Mary Abbots	St George's
		Paddington	St. Mary's
		Lambeth	St. Thomas's
St Giles Dulwich	King's College	St Mary, Islington	University College
Archway	Middlesex	St Stephen's	Westminster
St. Mary, Islington Highgate St. Pancras	Royal Free		

In addition, undergraduates from certain medical schools are accepted at the Council's hospitals for instruction in obstetrics Resident students are accepted from St Thomas's at St James' Hospital, from the London at Mile End, from St Bart's at St Andrew's, from Middlesex at St Mary Abbots, and from St George's and King's at Lewisham Non resident students are accepted from Guy's at St Alfege's from St Bart's at St Giles's, from University College at St Mary, Islington, from King's at Dulwich and from St Mary's at Paddington Students from St George's attend the lecture demonstrations on mental disease at St Pancras All students in London do their course in fevers at one or other of the Council's hospitals, and demonstrations in the diagnosis and treatment of smallpox are also arranged by the Council

Sir THOMAS DUNHILL, surgeon to the King and consulting surgeon to St Bartholomew's Hospital, has been appointed sergeant surgeon to the King in succession to Prof Wilfred Trotter, F.R.S., who has retired

Mr G GORDON BULGI assistant surgeon to the Aberdeen Royal Infirmary, has been appointed to be one of the surgeons to the King in Scotland

COURSE IN ANÆSTHETICS.—A three weeks course in preparation for the diploma in anæsthetics will be held at Guy's Hospital medical school beginning on Oct 16 The course will include lectures in physiology, anatomy, pharmacology clinical investigations and anæsthetics Further particulars will be found in our advertisement columns

Surgeon Rear Admiral THOMAS CREASY has been appointed honorary physician to the King

The status of director of Royal Air Force Medical Services has been advanced to that of director-general with the rank of air marshal Air Vice-Marshal Sir ALBERT RICHARDSON, director of the medical service, was promoted air marshal at the beginning of this month and is now director general

Lieut.-Colonel and Brevet Colonel L T POOLE, assistant professor of pathology at the Army Medical College, Millbank, has been promoted colonel and appointed director and professor of pathology at the College in succession to Major-General J H F Ferry who is retiring

Medical Diary

Aug. 28 to Sept 2

EDINBURGH ROYAL INFIRMARY
THURSDAY—5 P.M., Lieut.-Colonel John Cunningham: Occupational Therapy (Honyman Gillespie lecture)

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
FRIDAY—2 P.M., clinico-pathological conference (obstetrics and gynæcology)
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1
MONDAY to SATURDAY—WEST END HOSPITAL FOR NERVOUS DISEASES, Regent's Park, N.W.1, Mon. and Fri., 8 P.M., lecture-demonstrations in neurological surgery—BROMPTON HOSPITAL, S.W.3, Tues. and Wed., 5.15 P.M., course in chest diseases

Appointments

BARTON, D., F.R.C.S.E., resident surgical officer at the General Hospital, Walsall
BROWN, J. M., M.B. Glasg., junior assistant medical officer at Prestwood Sanatorium
FITT, THOMAS, M.R.C.S., resident anæsthetist at the Royal Berkshire Hospital, Reading
MAXWELL, J. S., M.B. Edin., F.R.C.S.E., senior resident surgical officer at the Princess Margaret Rose Hospital for Crippled Children, Edinburgh
RUST, HELEN W., M.D. Rome, resident surgical officer at the Royal Children's Hospital, Manchester
SEDGWICK, F. S., M.B. Edin., junior resident surgical officer at the Princess Margaret Rose Hospital for Crippled Children, Edinburgh
SIDDONS, JOYCE R., M.R.C.S., resident medical officer at the Children's Hospital, Southampton
SLOT, GERALD, M.D. Lond., M.R.C.P., D.P.H., consulting physician to the Teddington Memorial Hospital
SPENCE, J. C., M.D. Durh., F.R.C.P., hon. physician to the Royal Victoria Infirmary, Newcastle-on-Tyne
TAYLOR, C. W., M.B. Birm., pathologist and bacteriologist at the Birmingham and Midland Hospital for Women
THOMAS, D. TREVOR, M.R.C.S., assistant resident medical officer at the Cardiff Isolation Hospital
TYTLER, JESSIE M. R., M.B. Glasg., assistant medical officer at the Royal Institution, Colchester
VICKERS, H. R., M.B. Sheff., M.R.C.P., hon. secondary dermatologist to the Royal Infirmary and Hospital, Sheffield
WOODHAM, C. W. B., M.R.C.S., D.M.R.E., radiotherapist to the East Suffolk and Ipswich Hospital

Vacancies

For further information refer to the advertisement columns

Abercrave Workmen Medical Committee—Medical practitioner
Aberdeen Royal Infirmary—Surg. reg., £200
Accrington Borough—Deputy M.O.H., £500
Barking Borough, Barking Hosp.—Res. M.O., £350
Bath, Royal United Hosp.—Hon. anæsthetist
Birmingham, Cantrell Hall Babies' Hosp.—Res. M.O., at rate of £250
Birmingham, St. Chad's Hosp.—H.P. and anæsthetist, at rate of £150
Brighton, Royal Sussex County Hosp.—Two H.S.'s, £150
British Postgraduate Medical School, Ducane Road, W.12—Asst. in morbid anatomy in dept. of pathology, £300. Three demonstratorships in clinical medicine, each £150. Also two H.S.'s, each at rate of £105
Castleford Urban District Council—M.O.H., £800
Derbyshire County Council—Temp. Asst. M.O., at rate of £500
Dreadnought Hosp., Greenwich, S.E.10—H.P. and H.S., each at rate of £110
Durham County Council, Seaham Hall Sanatorium for Women and Girls, Seaham Harbour—Jun. res. M.O., £200
Erith Borough—Asst. M.O.H. and asst. school M.O., £500
Exeter, Royal Devon and Exeter Hosp.—Three H.S.'s and one H.P., each at rate of £150
Gloucester Royal Infirmary—H.S. to ear, nose, and throat dept. at rate of £170
Great Barrow, Chester, Barrowmore Hall Sanatorium—Jun. asst. M.O., £200
Guildford, Royal Surrey County Hosp.—H.P. and cas. O., £150
Hertford County Hospital—H.P., at rate of £150
Hounslow Hosp., Middlesex—Hon. physician for physiotherapeutic dept.
Leicester City General Hosp.—Res. M.O., at rate of £300
London County Council—Asst. M.O. (Class II.), £250
Manchester, Ancoats Hosp.—Res. M.O., at rate of £150. Two H.S.'s, at rate of £100
Manchester and Salford Hosp. for Skin Diseases—H.S., at rate of £150
Manchester, Royal Eye Hosp.—Jun. H.S. £120
Middlesbrough, North Riding Infirmary—Sen. H.S., at rate of £175
Mildmay Mission Hosp., Austin Street, Bethnal Green, E.2—Asst. cas. O. (female), at rate of £140
National Temperance Hosp., Hampstead Road, N.W.1—Cas. O., at rate of £120. Also H.P., at rate of £100
Newcastle-upon-Tyne, Barrasford Sanatorium—Res. med. asst., £250
Newcastle-upon-Tyne, Newcastle General Hosp.—Obstet. H.S., at rate of £150
New Zealand, New Plymouth Hosp.—Radiologist, £900 (N.Z. currency)
Northampton General Hosp.—Res. cas. O., res. anæsthetist, and res. H.S. to ear, nose, and throat dept., each at rate of £150
Norwich, Jenny Lind Hosp. for Children—Res. M.O., £120
Nottingham City Hosp.—Asst. res. obstet. officer, at rate of £250
Plymouth, City General Hosp.—Jun. asst. M.O. (woman), at rate of £250
Plymouth, City of—Deputy M.O.H., £750
Preston and County of Lancaster Royal Infirmary—Res. obstet. officer, £350. Also cas. H.S., at rate of £150
Prince of Wales's General Hosp., N.15—Res. jun. H.P. and H.S.'s, each at rate of £90
Princess Elizabeth of York Hosp. for Children, Shadwell, E.1—H.P., at rate of £125
Queen's Hosp. for Children, Hackney Road, E.2—H.P. and ear, nose, and throat H.S., each at rate of £100. Dental surgeon, £1 7s. 3d. per session. Also physician for whooping-cough clinic, 1 guinea per attendance
Queen Mary's Hosp. for the East End, Stratford, E.15—Res. M.O. and cas. O., each at rate of £150. H.S. and H.P., each at rate of £120. Also obstet. H.S., at rate of £110–£130
Radcliffe-on-Trent, Notts County Mental Hosp.—Second asst. M.O., £459
Radium Institute, Riding House Street, W.1—Res. M.O., at rate of £250
Rainhill, Lancs, County Mental Hosp.—Second and third asst. M.O., £700 and £650 respectively
Richmond, Surrey, Royal Hosp.—Jun. H.S., £100
Rotherham County Borough—Asst. M.O.H., £600
Royal Cancer Hosp., Fulham Road, S.W.3—Res. H.S. to radium dept. and H.S., each at rate of £100
Royal Naval Medical Service—Medical officers
Runwell Hosp., near Wickford, Essex—Sen. res. physician, £576
St. John's Hosp., Lewisham, S.E.13—Res. surg. O., £200
Salford Royal Hosp.—Res. surg. O., £200. Also H.P., two H.S.'s, and cas. H.S., each at rate of £125
Samaritan Free Hosp. for Women, Marylebone Road, N.W.1—H.S., at rate of £100.
Sheffield Children's Hosp.—H.P., at rate of £100
Sheffield, Jessop Hosp. for Women—Res. M.O., at rate of £150
Stoke-on-Trent City—Asst. M.O. for maternity and child welfare, £500
Stoke-on-Trent, London Road Hosp.—Sen. res. asst. M.O., £350
Stourbridge (near), Wordsley Public Assistance Institution—Asst. M.O., at rate of £300
Swansea County Borough—Asst. M.O., £500
Union of South Africa, Dept. of Public Health—Dietitian, £250
West Ham County Borough—Two res. M.O.'s at Whipps Cross Hosp., £350
West London Hosp., Hammersmith, W.6—H.P. and H.S., each at rate of £100. Also genito-urinary surgeon
Westmorland County Council—County M.O.H., £800
Wigan, Royal Albert Edward Infirmary—Pathologist and bacteriologist, £500
Windsor, King Edward VII. Hosp.—H.S., £120
Wolverhampton County Borough—Temp. asst. M.O.H., £600
Wolverhampton, New Cross Hosp.—Asst. M.O., £200
Woolwich and District Hosp. Assn., Shooters Hill, S.E.18—H.S. and cas. O., at rate of £100
The Chief Inspector of Factories announces a vacancy for an examining surgeon at Shefford, Beds

Births, Marriages and Deaths

BIRTHS

MITCHELL HEGGS—On Aug. 15, at Welbeck Street, W.1, the wife of Dr. G. B. Mitchell Heggs—a son
MURRAY—On Aug. 13, the wife of Dr. Francis Murray, of Tressillian Road, S.E.4—a daughter
POSFORD—On Aug. 20, the wife of Dr. Peter Posford, of Sanderstead, Surrey—a daughter
PURVIS—On Aug. 17, at Archers Road, Southampton, the wife of Mr. Raymond Purvis, F.R.C.S.—a son
SHARP—On July 23, at Shiraz, Iran, to Dr. Barbara Sharp (née Carden), wife of Rev. R. N. Sharp—a son

MARRIAGES

FOSTER—MOUBRAY—On Aug. 10, at St. Columba's Church, Aberdour, Fife, Surgeon Lieut.-Commander Samuel Kingsley Foster, to Barbara Moubray
STEDMAN—DIPPLE—On Aug. 16, at Langleybury Parish Church, Herman Stedman, F.R.C.S.E., of Iver Heath, Bucks, to Louisa Jenevera Dipple

DEATHS

CHETWOOD-AIKEN—On Aug. 17, at Calenick, Wood Lane, Falmouth, Knightley Chetwode Chetwood-Aiken, M.B. Aberd., late of Truro and Taunton, aged 68
PERCIVAL—On Aug. 20, at Kingsley Road, Northampton, George Henry Percival, O.B.E., M.B. Lond., aged 91
WILLIAMS—On Aug. 20, in London, Leonard Williams, M.D. Glasg., editor of the *Medical Press and Circular* (1916–18)

N.B.—A fee of 7s. 6d. is charged for the announcement of Births, Marriages, and Deaths

ADDRESSES AND ORIGINAL ARTICLES

TRAUMA AND PROGRESSIVE MUSCULAR ATROPHY

By J W Aldren Turner, B M Oxfd, M R C P

RESIDENT MEDICAL OFFICER AT THE NATIONAL HOSPITAL, QUEEN SQUARE LONDON

THE part played by trauma in the initiation of progressive generalised nervous diseases becomes occasionally subject to dispute in relation to workmen's compensation In view of the lack of data derived from any notable series of cases, it seems worth while to analyse a series of cases of progressive muscular atrophy to find out in what proportion a history of trauma is obtained. The term progressive muscular atrophy has been taken to include amyotrophic lateral sclerosis and progressive bulbar palsy with muscular atrophy

For this purpose a series of 100 consecutive cases of progressive muscular atrophy treated in the National Hospital between 1932 and 1937 has been selected The following criteria were adopted for the diagnosis —

(1) Signs of progressive degeneration of the bulbar nuclei associated with generalised muscular atrophy and fibrillation either with or without evidence of involvement of the pyramidal tracts (37 cases)

(2) Progressive muscular wasting associated with evidence of involvement of the pyramidal tract (40 cases)

(3) Widespread muscular wasting and fibrillation of the classical type of progressive muscular atrophy without involvement of the pyramidal tract (19 cases) There was no sensory impairment in any of the cases in these groups

(4) Post mortem confirmation of the diagnosis The pathological changes taken as confirmatory were degeneration of the anterior-horn cells, diffuse degeneration of the anterolateral tracts with the pyramidal tracts most affected, and degenerative changes in the Betz cells of the precentral convolution (4 cases)

Especial care has been taken to exclude cases such as those described by Walshe and Ross (1936), in which rather a similar condition has been caused by a local lesion in the cervical cord following an injury to the head The main features of these cases distinguishing them from progressive muscular atrophy are the inversion of the radial reflexes and pain on movement of the neck

Of the 100 patients 66 were males and 34 females, in the following age groups twenty–thirty, 4, thirty–forty, 11, forty–fifty, 30, fifty–sixty, 39, and sixty–seventy, 16 In 79 cases no history of trauma was obtained, whereas in the other 21 there was a history of trauma The relation of trauma to the onset of nervous symptoms seemed to fall into two categories trauma more than a year before the first symptom was noticed, and trauma within a year In the first group there were 15 cases, the trauma usually being many years before and varying greatly in severity, but usually being a fracture or a wound of a limb In the second group there were 6 cases, in 1 of which the trauma was merely a sprained ankle, of the other 5 more detailed clinical notes will be given

As a control a second series of cases was analysed. These were 100 cases of the same age groups and sex groups suffering from various organic diseases of the nervous system in which trauma is not thought to play an aetiological part In this series a history of trauma was obtained in 22 cases, the injury being more than a year before the first symptom was noticed in 20 cases In the remaining 2 cases a slight trauma preceded by a few months the first symptom of a cerebral tumour in one case and of a spinal tumour in the other

TABLE I—INCIDENCE OF TRAUMA

—	No trauma	Trauma		
		Under 1 year	Over 1 year	Total
P M A group (per cent)	79	6	15	21
Control group (per cent)	78	2	20	22

Table I shows the relative frequency of trauma in the history of 100 consecutive cases of progressive muscular atrophy and of 100 cases of other nervous diseases as a control It will be observed that in both the progressive muscular atrophy and the control series the total number of cases with a history of trauma was practically identical, and that it was only when an arbitrary period of a year was taken that a small difference of 4 per cent in favour of the progressive muscular atrophy group was apparent

CASE RECORDS

A few details will now be given of the 5 cases in which there was an injury within twelve months of the first symptoms They are summarised in table II

TABLE II—TYPE OF INJURY AND INTERVAL BEFORE DEVELOPMENT OF SYMPTOMS

Case	Trauma	Part first affected	Interval between trauma and first symptoms
1	Fall on to right shoulder	Right shoulder	1–2 weeks
2	Frostbite of left hand	Left hand	About 1 week
3	Two cerebral injuries	Right arm and leg	Nine months after first injury and immediately after second injury
4	Injury to right knee causing synovitis	Right leg	One month
5	Crushing injury to left hand	Left hand	Twelve months

CASE 1 —A male, aged 53, admitted on March 31 1937, under the care of Dr George Riddoch Eight months before admission, when mounting his bicycle he caught his foot in the pedal and pitched forward on to his right shoulder tip The right arm was painful and stiff and remained so for several days Then, as the pain wore off, he noticed that the right arm was weak at the shoulder, and about a fortnight later the elbow was weak and in the course of the next two months the weakness increased and involved the whole arm A month after the injury he noticed flickering in the muscles of the right hand, which seemed to be thinner Rapidly the weakness spread to all four limbs and two months before admission he became unable to walk and his voice became feeble

On examination his voice was feeble, but articulation was normal, and there was no fibrillation of the tongue There was wasting of all the muscles of both arms with fibrillation in the pectoral muscles He had no power in the upper limbs beyond weak adduction of the arms and flexion of the wrists and fingers There was gross wasting of all the leg muscles

with practically no voluntary power. All the tendon-jerks were very weak or absent, and the abdominal reflexes were absent and the plantar reflexes flexor.

He died of bronchopneumonia a few days after admission. Necropsy showed the typical degeneration of the anterior-horn cells, especially in the cervical and lumbar enlargements, and somewhat diffuse degeneration of the anterolateral columns, with special incidence on the pyramidal tracts.

This was a rapidly developing progressive muscular atrophy with post-mortem confirmation of the diagnosis. The injury which preceded the onset of symptoms by a month is most unlikely to have been due to pre-existing disease, for his fall resulted from catching his foot in the pedal of his bicycle, and weakness of the legs was not complained of till some months later, the first signs of disease appearing in the arms

CASE 2.—A male, aged 47, admitted on April 3, 1935, under the care of Dr. E A. Carmichael. In March, 1934, thirteen months before admission, he was handling some frozen cable, when his left hand became frostbitten; this consisted of swelling of the hand, which persisted for two or three days. When the swelling wore off, he found that the left hand was weak. Slowly the weakness spread to the rest of the arm, which became stiff Five months later he began to speak through his nose, and swallowing became difficult. Four months after the onset of bulbar symptoms his right grip became weak and his legs became weak and stiff.

On examination there was impairment of emotional control, and he had a slurring nasal dysarthria and slight weakness of the orbicularis oculi and oris muscles There was wasting and fibrillation of the tongue There was wasting, weakness, and fibrillation in the arms, more noticeable on the left. The legs were slightly spastic, and there was fibrillation in the quadriceps muscles. The tendon-jerks were increased, the abdominal reflexes present, and the plantar reflexes extensor There was no sensory loss The cerebrospinal fluid was normal.

This was a typical amyotrophic lateral sclerosis with bulbar palsy. It is conceivable in this case that the frostbite of the left hand was due to clumsiness of movement of the hand, resulting from pre-existing disease, but it is impossible to be sure on this point

CASE 3.—A male, aged 46, admitted on July 10, 1934, under the care of Dr. Hinds Howell. Eighteen months before admission he fell down sixteen stone steps and was unconscious for half an hour; immediately afterwards he had an aching pain in the right shoulder and hip, some tremor of the right leg, severe weakness of the right arm and leg, and retention of urine for a week after the accident. The power in the arm and leg gradually returned, but the pains persisted

Nine months later he was involved in a car smash and was unconscious for five minutes The next morning his right arm and leg were very weak and he could not walk. Since then he has not been able to walk without support and he has noticed slight weakness of the left arm and pain in the left shoulder.

On examination nine months after this second injury he was found to have increased tone in both arms, wasting of the first dorsal interosseous muscle in both hands, and fibrillation in both deltoid, biceps, and triceps muscles Both legs were spastic, and there was fibrillation in the calf muscles There was definite weakness of all movements of arms and legs, the right side being the weaker. All the tendon-reflexes were increased, the abdominal reflexes absent, and the plantars extensor There was no sensory loss. The cerebrospinal fluid and radiograms of the spine were normal.

This man presented a typical picture of amyotrophic lateral sclerosis with no evidence of a local lesion in the spinal cord. It appears likely that there was cerebral damage from each of the preceding injuries, for there was transient loss of consciousness and weakness of hemiplegic distribution on the right side. In this respect this case differs from the others, in which the injuries were to a limb The question of the injuries being due to pre-existing disease of the limbs does not seem to arise in this case.

CASE 4.—A male, aged 42, admitted on July 10, 1935, under the care of Dr. Kinnier Wilson In July, 1933, two years before admission, he tripped over a wooden post, which was lying on the ground, and he went sprawling into the road. He had severe pain in the right knee, but he was able to continue his round as a milkman. A few hours later the right knee became swollen and very painful, and the swelling took seven to ten days to subside. He was off work for a month.

A month later, when walking, he found that his right foot was dragging, and the leg felt weak. The next day it felt normal again, but about two months afterwards the right leg again felt weak, and he dragged it when he walked, and since then the weakness has gradually increased. A few weeks later the left leg began to feel weak, and he became conscious of fibrillation in both thighs and occasionally in the arms. The weakness of the legs was steadily progressive.

In July, 1935, on examination the cranial nerves and arms were normal There was ½ in. wasting of the right calf, and there was fibrillation in both calves. Both legs were spastic, and there was generalised weakness of the legs, greater on the right. The tendon-jerks of the arms and legs were exaggerated, the abdominal reflexes present, and the plantars extensor There was no sensory loss. The cerebrospinal fluid was normal.

This was a gradually progressive amyotrophic lateral sclerosis with the lower limbs more involved than the upper. An injury to the right leg causing synovitis of the knee preceded the onset of slight weakness of this leg by about a month No weakness of the legs of any kind had been noticed before he tripped over the wooden post.

CASE 5.—A female, aged 61, admitted on March 17, 1936, under the care of Dr. Hinds Howell Early in 1931 the inner three fingers of her left hand were crushed by machinery, the fingers swelled, and the nails dropped off. Three weeks later she returned to work, but she could not use the left hand. The hand gradually became normal, and after a few weeks she could use it normally. A year later, in 1932, she found that she could not move her left hand as quickly as she could before, and the fingers began to be drawn up into the palm During the next two years the left hand gradually became thinner and weaker.

Eighteen months before admission she fell and fractured her left wrist, and six months later she again fell and broke her left upper arm. During the last nine months both her arms and legs have gradually become weaker, so that on admission she could not walk.

On examination about five and a half years after the original injury the cranial nerves were normal. There was considerable wasting of the left hand and moderate wasting of the left deltoid, spinati, and forearm muscles, with complete loss of power in the left hand and weakness of the movements of the left arm and the right wrist and hand. No fibrillation was seen. Both legs were slightly spastic, and there was weakness of flexion of the thighs. The tendon-jerks were reduced in the left arm and normal in the right arm, the knee-jerks increased, and the ankle-jerks normal. Abdominal reflexes were absent and plantars indefinite. There was no sensory loss. The cerebrospinal fluid was normal.

This was a slowly developing progressive muscular atrophy, with only slight signs of involvement of the pyramidal tract. The fact that the weakness of the left hand, which followed the injury, cleared up

completely in a few weeks, and that there was then an interval of several months before progressive weakness and wasting of the hand developed, disposes of any suggestion that the accident was due to pre-existing disease

DISCUSSION

Trauma has from time to time been suggested as a possible cause of progressive muscular atrophy. Of the older authors, Gowers (1892) accepted it, saying that concussion of the spine rather than injury of a limb was more likely to cause it, and Bailey (1908), who reviewed the whole subject of injury and nervous disease, said: "The causal relationship of trauma to progressive muscular atrophy is fairly well established. A considerable number of cases are on record in which an injury of a limb was quickly followed by an atrophy of its muscles, a condition which later became generalised."

More recently Harris (1933) has been the chief exponent of the view that trauma may play some part in the aetiology, and he quoted the case of a man who shortly after a 500 lb. case had fallen on to his right foot developed muscular atrophy of the right foot and leg, which later became generalised and was accompanied by widespread fibrillation. Harris said: "Grave injustice is often done by the refusal of consultants to allow the possibility of cause and effect in progressive nervous disease following severe blows upon the head or spine." At a recent discussion at the Royal Society of Medicine (1938) several speakers agreed with this point of view.

Of those opposed to this view Kinnier Wilson (1923) is the most dogmatic, summing up with the words "I am unable to understand how a single trauma can cause a progressive neural degeneration or abiotrophy." Pollock (1937) in a recent review says that he thinks that the causal relationship of trauma and progressive muscular atrophy is most unlikely. Alajouanine, Gopcevitch, and Meilland (1930), in an account of the types of muscular atrophy which may follow trauma, do not mention progressive muscular atrophy, discussing only localised atrophy, hæmatomyelia, and myopathy.

The fullest account of the subject is by Jelliffe (1935), who collected all the cases reported up to that date, without giving any opinion on them. Of his cases 42 can probably be accepted as instances of true progressive muscular atrophy, and the most significant fact is that the injury was inflicted within a year of the first symptom in 40 of the cases. Since then only 3 cases have been reported. In one of these atrophy confined to the right arm, but with more extensive fibrillation, was noted 42 years after an injury to the left side of the head (Sutton 1938), and of the others (Geyer 1934) one started within a year of the injury and the other was rather an anomalous case with acute poliomyelitis as well as trauma in the history.

The evidence derived from the present inquiry shows that in the great majority of cases there is no question of trauma in the etiology of progressive muscular atrophy, and, when the control series of cases is considered, it is obvious that an injury several years before the first symptoms appear can also be discounted as a causal factor. The only difference in the incidence in the two series of cases appears when trauma inflicted within a year of the first symptom is considered. Even here the difference is only 4 per cent. and clearly so small a difference as this might arise by chance and cannot be considered as statistically significant. From these figures it must be concluded that trauma can play no primary part in the aetiology of progressive muscular atrophy.

In the 5 case records quoted, however, an injury preceded by a short interval the first symptoms, and in 4 of these cases the injured limb was the first part of the body to be affected. An objection commonly raised in cases of this sort is that the injury was really the result of the disease and served to draw attention to the symptoms, and it is often a matter of considerable difficulty to be sure about this point. I have considered this in the comments on each case, and real doubt about pre-existing disease is only present in case 2. These cases suggest that trauma, though not the cause of progressive muscular atrophy, may in a very small minority of cases act as a precipitating factor in the development of the disease, and that, when this happens, the first signs are likely to appear in the limb which has been injured.

SUMMARY

(1) An analysis has been made of 100 cases of progressive muscular atrophy and of a control group of 100 cases of other organic nervous diseases with regard to trauma as a possible aetiological factor.

(2) In 5 of the cases of progressive muscular atrophy there was a history of injury within a year of the first symptom, and in 3 of these the injury was within a month of it. Details of these cases are given.

(3) It is concluded that trauma plays no primary part in the causation of the disease, but in a very small minority of cases it seems to precipitate the appearance of symptoms.

My thanks are due to the medical committee of the National Hospital, Queen Square, for permission to report these cases, and to Dr. D. E. Denny-Brown for help in the preparation of the paper.

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"People of this constitution may be said to live perpetually in a state of hate, for so long as aggressiveness is thwarted, i.e., so long as the position falls short of absolute power, hatred will be favoured constantly, even where no object for the hatred existing can well be found. In those rare instances where the external resistance is overcome, where absolute power is attained and day-dreams achieved, the hatred will persist as a habit and find still more vague and more remote objects, but it will tend gradually to be supplanted as the prevailing emotion, by fear. For we all picture the world in terms of our own mentality, and an aggressive person peoples his environment with similarly aggressive people so that the fear of those around him is in direct proportion to the quantity of his own aggressiveness. Where the external resistance is real it can be calculated and so the fear is limited; but when it has been overcome, the habit of fear remains like the habit of hate, and the hate and the fear become all the greater because these objects are now diffuse and incalculable. Fear of the unknown as everyone knows is greater than fear of the known; thus the price of absolute dominion is a state of heightened vindictiveness and fear."—Dr. R. D. GILLESPIE: *The Psychology of Dictatorship*, *Catholic Medical Guardian*, July 1939, p. 12.

TREATMENT OF FRACTURES BY LOCAL ANÆSTHESIA

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Leriche (1928, 1936), Fontaine (1936), and Campbell (1938a and b) have described the use of local anæsthesia in the treatment of fractures. This paper records the results of 100 consecutive cases of "minor" fractures treated by their methods. By the term "minor" fracture I mean a fracture in which there is no displacement and no possibility of displacement during the normal functional activity of the part in question. Every incomplete fracture has, therefore, been thus treated. In addition, however, complete fractures in certain situations—e.g., internal and external malleoli, phalanges, and base of the fifth metatarsal—have been included.

Too often, in the past, fractures have been treated by routine methods which took into account only the site and not the degree of the injury. In the enthusiasm to adopt Böhler's methods his basic principle of "functional activity during treatment" has been forgotten. Böhler reasoned that the more the injured limb was used, the quicker and the better was the callus formed, and muscular atrophy and stiffness were reduced to a minimum. How much better, then, that the fractured bone should be used throughout its normal range of movement, unrestricted by splints or plaster.

METHOD

After thorough sterilisation of the skin, a 2 per cent. solution of procaine is injected into the hæmatoma between and around the fractured ends of the bone. The affected area is massaged to ensure the thorough dissemination of the procaine. The patient is then told to use his limb throughout its full range of movement. Supporting strapping is only used when there is excessive œdema in fractures of the ankle and in "second"-degree fractures of the ankle. The amount of procaine used varies with the site of injection—e.g., 5–10 c.cm. around the ankle, 2–3 c.cm. in fractures of metatarsal and metacarpal bones, and 0·5–1 c.cm. in fractures of phalanges.

RESULTS

The following types of fracture were thus treated.—

Ankle fractures.—Of 33 fractures of the ankle 20 involved the external malleolus, 5 the internal malleolus (in 8 of these 25 the opposite lateral ligament was also involved), 4 the internal and external malleolus, and 2 the posterior malleolus. The remaining 2 were trimalleolar.

Campbell (1938a and b) confined his treatment to "first-degree" fractures of the ankle—*i.e.*, fractures of one malleolus only. Here the scope has been extended to "second-degree" fractures—*i.e.*, fractures of both malleoli or fracture of one malleolus with involvement of the opposite lateral ligament of the ankle. In these cases the tender area on each side of the joint was injected. These "second-degree" fractures are, however, strapped for two weeks after the injection, because in these cases the ankle-joint is unstable. Similar treatment was given to 2 cases of trimalleolar fracture—*i.e.*, fracture of the internal and external malleoli with fracture of the posterior articular surface of the tibia.

Of the 33 cases of fracture of the ankle thus treated only 4 needed a further injection because of subsequent pain. No case needed more than two injections. All the patients were made to walk immediately after the injection. Their confidence being thus gained, they were told to continue active movement throughout the treatment. Subsequent radiographic control at the end of six weeks seems to suggest that more callus was formed than with the usual methods of immobilisation.

The old bugbear of "stiff ankle," so often seen in the treatment with plaster, was non-existent. The length of treatment was reduced, for every one of the 33 patients had resumed normal working activity within six weeks of injection—most in much less time, and one, on his own initiative, within three weeks. It would be wrong to say that the full range of movement was obtained in all cases immediately after injection. In those with little evidence of local trauma to the tissues—i.e., without œdema or bruising of the soft parts—this was possible, but in those with considerable œdema or much extravasation some awkwardness of gait and stiffness of movement could be expected for the first seven to ten days.

Metatarsals.—Of 13 fractures 9 involved the fifth metatarsal, 2 the fourth, and 2 the second. These were injected from the dorsum of the foot. Of the 9 fractures of the fifth metatarsal 6 were complete. The fractures of the fourth and second metatarsals were incomplete. Of the 13 patients 12 were back at their normal work within three weeks; the thirteenth needed a second injection a week after the first and was off work for five weeks. No deformity—e.g., flat-foot—has yet developed in any of the cases. Complete fractures of bones other than the fifth metatarsal have not been injected, because of the danger of such deformity if no supporting splint were applied.

Phalanges.—Of 27 fractures 16 involved fingers and 11 toes. Of these 27 fractures 7 were complete, and crepitus could be elicited. Perhaps the close binding of the soft tissues round the bones of the phalanges prevents any gross displacement during normal movement, despite the tendency to anterior angulation from the action of the lumbricals and the interossei muscles or of the long flexor tendons. Whatever the explanation, normal union in good position was obtained in all cases. In complete fractures each side of the phalanx was injected.

Metacarpals.—There were 2 cases, 1 involving the second and third metacarpals and 1 the second metacarpal. These were incomplete fractures, and both patients were back at work within three weeks. Complete fractures could not be so treated, because of the danger of displacement by the interossei muscles.

Ribs.—Cracked ribs (8 cases) were injected over the point of maximal tenderness. There was no subsequent pain, and complete union resulted in all cases.

Coccyx.—There were 2 cases, without displacement, and no pain or disability resulted after treatment.

Fibula.—There were 7 fractures of the head or shaft. All the patients resumed work immediately, and full union was obtained.

Spinous processes.—There were 2 cases, and both patients resumed work immediately. Here the close ligamentous and muscular attachment would prevent any possibility of displacement.

Great trochanter of the femur.—There were 2 cases, both incomplete cracks with pain on walking. All pain and disability vanished immediately after injection.

Cuneiform bone.—There were 2 fractures of the first cuneiform. Both patients returned to work immediately.

Os calcis.—There were 2 cases of incomplete crack across the body of the os calcis. The severe pain, which had prevented the patients from putting their heels to the floor, disappeared immediately after injection. They were at work again in two weeks with no subsequent disability.

COMMENTS

These results of the treatment of 100 consecutive cases of "minor" fracture seem to justify a more widespread use of local anæsthesia in the treatment of fractures. Not only are the pain and the disability quickly relieved, but also a more rapid return to normal functional activity is achieved.

It may be reasoned that there is always a danger of displacement. This has not happened in any of these cases. Moreover, it should be borne in mind that, besides their normal kinetic activity, the muscles of the body have a postural function which helps to bind and keep the bones in their definite form.

There is also an important psychological factor to be considered in the treatment outlined. To the normal lay patient a fractured limb is a limb that should not be used. He views with great suspicion any efforts to persuade him to the contrary. For example, a patient with a fractured ankle, after injection, puts his foot to the ground with great trepidation. When told to walk he does so with a stiff ankle and a stiff knee. We have usually, therefore, to spend ten minutes re-educating the patient in the difficult art of walking.

In about a third of the cases "after-pains" (Leriche) occurred about twenty-four hours after the injection. They usually lasted for about twenty-four hours and then disappeared altogether. These "after-pains" were, in many cases, more severe than the original pain, and so, as a routine, we now warn the patient that they may follow. Further, although all pain has disappeared, it is usually possible to elicit some tenderness over the site of the fracture for 10–14 days after the injection.

SPRAINS

It may also be of interest that, during the period covered by the above cases, I treated 30 cases of "sprain" by the same method. The results are summarised below.—

Supraspinatus tendinitis.—In 5 cases 10 c.cm. of a 2 per cent. solution of procaine was injected over the point of maximal tenderness—i.e., the great tuberosity of the humerus. The average period of disability was six days.

Sprains round the ankle.—In 11 cases 10 c.cm. of a 2 per cent. solution of procaine was injected into the point of maximal tenderness. The period "off work" varied from seven to seventeen days. One patient was hurt playing rugby on a Saturday. He was injected on the following Monday and played again without any ill effects the following Saturday.

Sprains round the knee.—In 14 cases 5–10 c.cm. of a 2 per cent. solution of procaine was injected into the painful area. The period "off work" varied from ten to twenty-one days.

SUMMARY

The results of treatment of 100 consecutive cases of minor fracture by local anæsthesia are reported. Pain and disability were quickly relieved and normal function returned more rapidly than it does with other treatment. No displacement followed. In about a third of the cases there were "after-pains" some twenty-four hours after the injection of procaine. Although all pain disappeared, it was usually possible to elicit tenderness over the site of fracture for 10–14 days after the injection.

Local anæsthesia was also used successfully in the treatment of 30 cases of sprain.

I am indebted to Mr. A. B. Pain, honorary orthopædic surgeon to the Dewsbury and District General Infirmary, for permission to publish the above results.

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URETHRAL OBSTRUCTION FOLLOWING PROSTATECTOMY

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OBSTRUCTION following prostatectomy is a complication which has received a good deal of attention in the past, but I am not sure that its ætiology has excited as much interest as its prophylaxis. The mechanism of the obstruction seems to have been taken for granted, and certain facts in regard to it have not been given their full significance.

Thomson Walker's name is outstandingly associated with this complication of prostatectomy, indeed the operation which he designed and practised was expressly planned to forestall it. He published a long series of cases in 1927 and an even longer in 1930 (the latter including the former). The second of these amounted to 75, but included examples of recurrent obstruction from such things as tags, adenomatous nodules which had been overlooked, and adenomatous nodules which had re-formed. For the purpose of the present argument these cases can be disregarded, anyway they represent only a small fraction of the whole series. The cases that concern us are those of true narrowing of the bladder outlet, and it is obvious at once on looking at the list that these can be divided into cases of narrowing at the internal meatus and cases of narrowing in the prostatic bed. The striking thing about this combined group is that the first are far more numerous than the second, the proportions being somewhat as follows, meatal narrowing 85 per cent. and prostatic bed narrowing 4·3 per cent. In 7 cases the outlet was completely obliterated and there were false passages behind it. There was a permanent fistula in 4·3 per cent., and the remainder complained of frequency, dysuria, and recurrent attacks of retention. Usually the trouble had begun during convalescence from the prostatectomy.

In 39 cases the type of prostate removed was ascertained. Of these 17 were fibrous, 3 contained calculi, and 19 were adenomatous, no distinction is made in the last group between the intravesical and subvesical types of enlargement. Thomson Walker remarks that the technique employed was always "blind." The causes which he gives as partly responsible are incomplete removal and sepsis. He was dubious about the Harris technique as a possible solution of the problem. None of the

cases appear to have been in the first place his own, and he apparently considered his own operation immune from this complication

As to treatment, he counselled urethral dilatation if possible but found very often that the hardness of the fibrous tissue made it difficult, dangerous, and unsatisfactory. In particular he was afraid of creating false passages through the trigone, because he realised that the meatus was as a rule drawn well forwards; to avoid this he advised that the point of any instrument should be kept well forward under the pubic arch until it had entered the bladder.

Thomson-Walker's prostatectomy was deliberately planned to obviate any subsequent narrowing, and the method adopted was the excision of a wedge from the shelf which bounds the meatus posteriorly after the gland has been shelled out. This amounted to a division of the sphincter vesicæ, although this aspect of the matter was not emphasised Faced with a postoperative meatal narrowing he carried out practically the same procedure, which he had proved to be such a useful adjunct to an ordinary prostatectomy. Always at operation he was impressed by the absence of any fibrosis in the anterior segment of the bladder neck as contrasted with the hard and thickened ridge posteriorly. He used a catheter as a routine both after prostatectomy and after restoration of the urethra

Riches and Muir in 1933 investigated the possibility of anticipating from the nature of the enlarged prostate what the results of its removal might be For this purpose they divided their prostates (114 cases) into glandular, intermediate, fibrous, and calculous types; unfortunately the first two groups were far larger than the second two. Results were classified as good, bad, or indifferent The bad results were mainly attributable to sepsis and stenosis at the internal meatus Stenosis was found far more commonly in the fibrous and calculous types than in the others It is clear, however, that a distinction was not made between stenosis at the internal meatus and stenosis in the prostatic bed, for the authors say that the complication may be considered "an inevitable result of the impossibility of removing all the fibrous tissue which commonly extends throughout the prostatic urethra in the fibrous type and the impossibility of taking away all the gland in the calculous type" This shows that at least in some cases the stenosis was not at the internal meatus

Emmett (1937) throws some sidelights on this question of postoperative stenosis in an account of diathermy resection carried out for persistent or recurrent symptoms after prostatectomy. Causes he lists as infection, scarring, incomplete removal, and carcinoma, and he points out that, although in nearly half his cases a fistula had persisted from the time of the first operation, in others the recurrence of trouble was delayed for as long as eight years. He met with the most bizarre deformities and angulations in the posterior urethra but was impressed by the frequency of an elevation of the posterior vesical lip, resembling in appearance a high median bar. Naturally he was more interested in the condition he had to deal with than with its possible causation, but he hazarded the observation that, although a skilled surgeon was unlikely to leave nodules behind, his cases seemed as liable to stenotic complications as those of his less experienced colleague

What other information I have been able to collect on this matter tends to be ambiguous where it is not actually contradictory. It refers mainly to the sequelæ of prostatectomy when the gland is hard and fibrous, and the general impression is that the danger is greatest when the vesicoprostatic opening is narrow from the start—i e, when the enlargement is subvesical, as it always is when the gland is fibrous.

CASE-RECORDS

Here is a summary of some cases I have seen myself.

CASE 1.—An elderly man, who some ten years previously had undergone prostatectomy and had never passed water in the natural way since then, came to me wearing an apparatus and with every evidence of a foul cystitis. I removed from his bladder, which was almost filled by it, one of the largest stones I have come across. The prostatic urethra was occluded by a fibrous sheet through which the head of a sound, passed down the penile urethra, could easily be felt. He had expressly forbidden any interference with this obstruction.

CASE 2.—I saw in consultation a man whose prostate had been removed three or four weeks previously, since when he had failed to pass any water. Neither his surgeon nor I could succeed in catheterising him. At the second operation his internal meatus was found to be completely closed, despite the fact that so recently a sizable prostate had been removed through it. At that time it had admitted two fingers; when I saw it it was represented only by a dimple. By cutting down on a bougie and excising the greatly thickened posterior lip of the orifice the obstruction was removed, and the man has had no trouble since.

CASE 3.—This patient had had prostatectomy three years previously but of late all his symptoms had recurred. He had already been seen by another surgeon, who had dilated him and warned him that he might need electrical removal of tissue. When I saw him, no instrument would pass No abnormality was detected per rectum. Although I lost sight of him I heard later that he was admitted to hospital with acute retention. The facts were inconclusive, but I suspect that this was an example of the type of obstruction which I am discussing.

CASE 4.—The patient came with a history of a straightforward enucleation of a moderately enlarged prostate. Resumption of micturition was delayed, and no instrument could be passed. The prostatic bed became heavily infected, and pus poured from the urethra. At operation the internal meatus was found to be completely closed.

CASE 5.—This patient had a history similar to that of case 4 but was my own case. I had been passing a sound regularly, and the closure must have taken place during the third week, when I left a deputy in charge who neglected instrumentation; on my return it was no longer possible. The internal meatus had closed. Originally the vesicoprostatic opening had been large enough to admit of the delivery of a tolerably large prostate.

CASE 6.—A patient with a similar history to that of cases 4 and 5. In my temporary absence instrumentation had been neglected and, when I returned, was only possible with the smallest sound. However, some degree of dilatation was attained and a catheter tied in. As soon as this was removed, the narrowing recurred. The suprapubic wound never healed. In this case the stenosis arose in the prostatic urethra as a fibrous diaphragm stretching across it about a ½ in. below the easily identifiable and uncontracted internal meatus. The gland in the first place had been apparently small and fibrous but microscopically showed "actively growing adenomatous structure with round-celled reaction."

In four of these cases information was available about the technique employed in the prostatectomy. They were all simple enucleations, and no attempt was made at excision of a shelf or reconstruction of the urethral floor In the two of them which I performed the fact that the removal was at a second

stage and the patient's general condition was poor precluded any elaboration

ANATOMY

The musculature at the internal meatus is an elaboration of the vesical musculature into two distinct components One, the sphincter, surrounds the meatus like any other sphincter, but closer study reveals that anteriorly it is considerably attenuated Its action is such as might be expected from a muscle of this type The other component is the trigonal muscle, which is more complicated It is fan shaped and arises from a broad base along the whole length of the bar of Mercier, from which its fibres converge forwards to hook over the posterior segment of the sphincter and thence downwards in the urethral floor to their insertion near the verumontanum, this latter portion is known as the muscle of Bell The antagonism between these two muscles is obvious one closes the orifice, and the other opens it Young and Wesson in 1921 published a remarkably instructive series of pictures illustrating this mechanism The plates depict the internal meatus at rest and in the attempted act of micturition as seen through a direct vision urethroscope It should be remembered that even at rest the meatus is not circular, its margin is somewhat flattened posteriorly In these pictures of attempted micturition one sees this flattening so exaggerated that the outline becomes triangular, at the same time the urethral floor is seen to be depressed and the verumontanum drawn up What is happening is clear The posterior meatal lip is being dragged backwards by the contracting trigonal muscle, and this proceeds until the angulation of the muscle is eliminated The result is a urethral floor which slopes smoothly and uninterruptedly upwards on to the trigonal surface (This is the anatomical ideal to be aimed at after a reconstruction of the internal meatus by endoscopic resection)

The mechanism is considerably disturbed by prostatic enlargement, especially if the prostate projects into the bladder A middle lobe must of necessity stretch the sphincter and displace it backwards by its projection Not only does it displace the sphincter but it displaces the trigonal muscle also—in this case to either side Evidence of the derangement can easily be obtained by examination of an operation specimen The grooving of the sphincter can be seen surrounding the middle lobe, and some of its fibres can be identified clinging to it the grooving of the trigonal muscle can be recognised on either side along the base of its lateral aspects Consequently function is interfered with, and no amount of hypertrophy can compensate

This distortion of the meatal mechanism by the enlarged prostate is widely recognised, whereas the effect of removal of the prostate is largely ignored It is assumed that prostatectomy leaves a permanently gaping orifice, but this is not necessarily so When the gland is removed the sphincter is little disturbed anteriorly and retains its normal attachments, because it is only on the most exceptional occasions that there is an anterior lobe to be undermined The lobes which require enucleation are the lateral and middle, with the result that the muscle is separated from its natural bed all along its lateral and posterior borders Further, the trigonal muscle is completely severed from its insertion into the verumontanum

EXPLANATION OF OBSTRUCTION

We are then left with a sphincter attached anteriorly but free elsewhere, save for its continuity with the vesical musculature, which does not restrain its activities That specialised portion of vesical musculature which is normally its antagonist—i.e., the trigonal muscle—can no longer fulfil its office At the same time the sphincter is still potentially contractile Is it to be wondered at that contraction occasionally takes place, or that, when it does take place, it not only closes the bladder exit but also draws it forwards under the pubic arch?

I believe this to be the explanation of these cases How else can the suddenness and solidity of the occlusion be explained? How else can the fact that the occlusion most commonly occurs at the wider end of the funnel shaped prostatic cavity be accounted for? How otherwise is it possible to interpret the reduction of a vesicoprostatic opening that is two or three finger-breadths wide to the dimple so commonly found at the second operation, or indeed to make intelligible the dimple itself? What other reason can there be for the frequency of posterior "scarring" and the absence of anterior? No one who has even a small experience of this particular complication of prostatectomy can accept the assurance that a wide opening is any particular safeguard To my mind a muscular closure of the bladder neck supplies the most likely explanation of all the phenomena That fibrosis is superimposed on closure detracts nothing from the argument, since circumstances indisputably predispose to it, but that it is the initial change seems to me improbable (There is, of course, the other variety of stenosis, which is a true stenosis and occurs in the prostatic bed, most commonly after the removal of a fibrotic or calculus containing gland)

PROPHYLAXIS

With regard to prevention there is ground for much difference of opinion Obviously, open operation is indicated, whether it takes the form of a Thomson Walker excision of shelf or a Harris reconstruction of urethra The general opinion nowadays seems to favour the latter method, although there are objections to it Some of these are on technical grounds, and I do not propose to deal with them here, others affect the principle of the procedure It is indisputable that an operation of this kind must add greatly to the length of time which the patient spends under the surgeon's hands The delay is inevitable, not only because of the elaboration of technique but also because of the time occupied in obtaining adequate exposure Should the prostatectomy follow a cystotomy this second factor becomes of very great importance, because it is necessary, if the prostatic bed is to be completely exposed, to dissect away all the scar tissue surrounding the suprapubic sinus and to free, to a greater or less extent, a contracted and sometimes fibrotic bladder These considerations must weigh heavily in the balance against open operation when the patient's general condition is not all that might be desired The question arises whether Thomson Walker or Harris methods completely obviate the possibility of contracture Undoubtedly they do not, because cases have been reported of its occurrence after their employment However, the reports are isolated and often lacking in detail, so it would be rash to draw any far reaching conclusions from them

There is another aspect of the matter which claims attention As regards end results, both Thomson-Walker and Harris were most concerned about fibrosis If the real danger is closure of the bladder neck and not fibrosis is there an opportunity for a modification of technique?

One thing is certain, and that is that the indwelling catheter forms an essential part of the after-treatment of prostatectomy, however obnoxious it may be on hygienic grounds. Morson (1930) says that the healing in the prostatic bed is slow and is still incomplete when the suprapubic sinus has closed, even when the urethra has been reconstructed. This seems very probable and should be kept in mind when deciding when to dispense with the catheter. It does not follow that the catheter is still required after micturition has been restored, for micturition serves to maintain patency; but even at this stage the daily passage of a bougie is a wise safeguard. With regard to the insertion of the catheter the following point should be remembered. Its tip, if it is to be of any use at all in preventing contracture (and it is rather doubtful whether it can be, so far as the bladder neck is concerned), must lie within the meatus but not so far within it as to cause ulceration of the opposite bladder wall.

The indwelling catheter is particularly useful when true stenosis is to be feared—i.e., after removal of a fibrous or calculous gland. Occasionally the enucleation of a truly adenomatous enlargement is accompanied by a sagging out of a strip of urethra; if this accident is not noticed at the time, penile bleeding, when the patient gets back to bed, may suggest it. Here again there is danger of stenosis. It is a moot point whether a fibrous gland is ever suitable for prostatectomy if endoscopic resection can be performed.

TREATMENT

The diagnosis of this complication is made on the symptoms and on the difficulty in instrumentation. When, during convalescence from prostatectomy, catheterisation becomes increasingly difficult and micturition is delayed, its presence should be suspected. In these circumstances, especially if the surgeon is unfamiliar with the possibilities of the case, there is a strong temptation to force a passage at all costs, the patient having reached the stage at which his one ambition is to begin passing water in the natural way as soon as ever he can. This is the time for the greatest patience and gentleness, since a little reflection will make it clear that difficulty in instrumentation after prostatectomy is a matter of some gravity.

In the bladder-neck group any attempt at force is likely either to drive the instrument through the trigone or, worse still, to strip up the bladder from its attachments. The dangers of trauma are increased if there is any sepsis to be reckoned with, and the menace of a pelvic cellulitis is always in the background. If a sound can be introduced (this can sometimes be done by keeping its point well forwards), something may be achieved by gradual dilatation. In the early stages of closure the posterior Kollman may have a place in treatment; in the later the resectoscope may be useful. The true fibrotic strictures are more amenable to instrumentation if taken in time, but it should be remembered that the urethra is often distorted into a caricature of its normal course by the scarring.

In many cases it will be found impossible to pass any instrument, and open operation is then inevitable. When the meatus is closed, all the indurated tissue posteriorly is cut away until wide communication is established. It simplifies the procedure if a steel sound is passed through the urethra and its point cut down on from above. Very little bleeding takes place.

When the stenosis is in the prostatic bed the approach is similar, but there are two dangers to be remembered in the excision of tissue. One is the proximity of the rectum posteriorly. The other is the proximity of the compressor urethræ, on which subsequent control depends, inferiorly. The after-treatment is with a retained catheter followed by dilatation.

SUMMARY

(1) There are two varieties of obstruction after prostatectomy: one arising at the internal urinary meatus, and the other in the prostatic bed.

(2) Obstruction at the internal meatus is far commoner than obstruction in the prostatic bed and is due not primarily to fibrosis but to muscular closure of the bladder neck.

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ACCIDENTAL TRANSMISSION OF MALARIA

TO A CHILD BY THE INJECTION OF BLOOD

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THE risk of using persons who may possibly be suffering from latent malaria as donors for a blood-transfusion is probably not sufficiently recognised. In England there has only been one recorded case of the accidental transmission of malaria to the recipient by blood-transfusion (Thomas, Keys, and Dyke 1936). Recently, however, Wright (1938) collected records of 29 cases in which malaria had been accidentally transmitted by blood-transfusion or by the intramuscular injection of blood. Reports of these accidents have come from several countries, but mostly from those where malaria is not endemic. In malarial countries the risk of transmitting the disease by the injection of blood must be greater, owing to the increased chance of any donor having malaria. It is, however, difficult to prove a definite example because of the impossibility of excluding a natural infection through the agency of a mosquito (Wang and Lee 1936). It is now well known that malarial infection may remain latent for many years in a person even after he has left a malarial country. This latent malaria may be symptomless, and even the initial infection may have gone unrecognised. The risk of using as donors of blood persons who, although they have no symptoms, yet may possibly have acquired malaria while living in a malarial country is thus obvious. The truth of this is borne out by Wright's collected cases, in which less than half the donors had had symptoms of malaria.

This paper records another instance of the transmission of malaria by an intramuscular injection of blood. The recipient, who was an infant, died from the malaria before treatment could be instituted. This is the first occasion on which this complication has proved fatal and it thus emphasises the need for care in the selection of a donor.

CASE-RECORD

The patient was a female infant and was the first child Her ill fortune began at birth, for she was born in a state of blue asphyxia The labour had been normal, and no instruments were used On the first day of her life she had repeated attacks of cyanosis apparently due to subarachnoid hæmorrhage, for the cerebrospinal fluid was under pressure and contained blood The lumbar puncture brought about an improvement in her condition, but on the third day she began to vomit bloodstained material Later she became moderately jaundiced and passed almost black motions She was admitted to the Hospital for Sick Children on the eighth day (Sept 30, 1938) She did not then appear very ill, and her *hæmoglobin percentage* was normal A diagnosis of melæna neonatorum was made, and she was treated by an intramuscular injection into the buttock of 7 c cm of whole blood obtained from her father The infant improved rapidly and, there being no evidence of further bleeding, was discharged on Oct 10, 1938

For the first four weeks after her discharge she progressed normally, but during the three weeks preceding her second admission into hospital there was a history of restlessness, difficulty in feeding, sweating at night, and several small epistaxes There had also been five convulsions, which had taken place at irregular intervals, the last happening on the day before admission

She was readmitted on Dec 6, 1938, then being aged ten weeks Her head was found to be enlarged, *with a circumference of 15 in*, the fontanelle was larger than normal The only other abnormal signs were an easily palpable liver and a spleen that reached the level of the umbilicus She was apyrexial on admission, but in the evening of the second day in hospital her temperature suddenly rose to 102° F On the next day a blood-count gave the following results —

Red cells	2,520 000	Polymorphs	47 5%
White cells	9300	Lymphocytes	35·0%
Hæmoglobin	55%	Monocytes	14·0%
Colour-index	1 1	Eosinophils	Nil
Normoblasts 16	per 100 red cells	Basophils	Nil
Erythroblasts 4 5	" "	Metamyelocytes	1 0%
Megaloblasts 2	" "	Myelocytes	1 5%

There was well-marked anisocytosis, poikilocytosis, and polychromasia, with many Howell Jolly bodies and free nuclear fragments But the blood film yielded much more important information than this There were present also many typical quartan malarial parasites in various stages of development, including a few gametocytes films taken the next day showed the parasites to be present, but in much smaller numbers The infant rapidly became worse, there was respiratory failure, and she died on the 10th in spite of treatment in an oxygen tent and before specific therapy could be started She remained pyrexial to the end

Post mortem examination —The body was that of a female infant weighing 10 lb There was no external abnormality The brain weighed 675 g and appeared normal, there being no evidence of hydrocephalus The heart was normal except for a patent foramen ovale, the ductus arteriosus was not quite closed The lungs appeared normal The liver was a little enlarged and somewhat *bile-stained*, it weighed 230 g The spleen was much enlarged (weight 70 g); it was firm and dark red There was a small splenunculus at the hilum. The kidneys (average weight 72 g) were normal except that the right ureter passed in front of the lower pole of the kidney The ureters, pelvis, and bladder were otherwise normal No abnormality was discovered in the gastro-intestinal tract

Histological examination —The sinuses of the liver were congested, the Kupffer's cells were prominent and contained much dark brown granular pigment Inside the sinuses a few finely pigmented circular bodies were identified as malarial parasites There was a little fine granular pigment in the hepatic cells, which were otherwise normal None of the pigment gave the prussian-blue reaction for iron. Many nucleated red cells were present in the sinuses

The spleen also was congested There had been much hyperplasia of the reticulum cells and other large phagocytic cells, many of them contained granules of brown pigment which did not give the prussian-blue reaction A few malarial parasites could be distinguished, both free and engulfed in phagocytes Many normoblasts and megaloblasts were present in the pulp, being collected in places into small collections of actively erythropoietic tissue

The kidney showed no abnormality apart from acute congestion The heart muscle was normal In the pancreas there was a peculiar area of cellular infiltration, whose nature was not quite certain, but which probably resulted from myeloid metaplasia The brain was normal

FURTHER INVESTIGATIONS

The discovery that the child had malaria necessitated careful inquiry into how she became infected Apart from her time in hospital she had lived in the neighbourhood of West Byfleet, Surrey, and the possibility of infection by a mosquito can be excluded The mother was healthy and had always lived in England On the other hand, the father was born in Ceylon in 1908 and had lived there until 1936, except for six years, 1914–20 After living in Ceylon he went to Gibraltar for three years He has lived in England ever since and thus has been away from Ceylon for twelve years He had been in parts of Ceylon notorious for malaria and had been in the habit of taking quinine prophylactically, but he never to his knowledge acquired the disease His only illness was an attack of fever at the age of sixteen, which was diagnosed as dengue fever Since leaving that country he has been perfectly fit and well and lives an active life as a police constable

Nevertheless, it appeared evident that the infant acquired malaria through the injection of the father's blood, and it has been possible, through the kind coöperation of Dr E L Hutton and Mr P G Shute, of the Horton Hospital, Epsom, to prove that his blood contains quartan parasites A therapeutic injection of 10 c cm of the father's blood was made into a patient with general paralysis of the insane At first nothing happened, and it was thought that the experiment was negative, so the patient was inoculated with *Plasmodium ovale* Soon after he had developed this form of malaria, quartan parasites also began to appear in his blood and later predominated The two types of parasites could be distinguished from each other in the films, and there was thus clear proof that the father still harboured quartan parasites in his blood, although they could not then be directly demonstrated in blood smears Later, however, while under observation, the father had a short attack of fever, and more blood was taken for observation Mr. Shute found a few quartan parasites in thick films although two patients inoculated with the blood did not develop malaria.

COMMENT

The great length of time during which malarial parasites can persist in a person without producing symptoms has been shown on many occasions Such a demonstration is afforded when a patient has a relapse many years after the initial infection without exposure to fresh infection, or when the infection is transmitted to another person with an improperly cleansed syringe or needle or by the injection of blood Walton (1931) mentions a relapse of benign tertian induced by splenectomy in a patient who had

had malaria as a child but had lived symptom-free outside malarial districts for thirty-three years In an example of the transmission of malaria by blood-transfusion, described by Stein (1932), the donor was a native of Greece who had lived in America for sixteen years. He had never to his knowledge suffered from malaria but had had several short periods of ill health Naveiro (1934) describes a case in which the donor had had malaria thirty-seven years previously and since then had been without symptoms

These observations show that every person who has had malaria, although he has remained free of symptoms for many years, must be regarded as a potential carrier of the parasites in his blood. So also must be regarded any person who has lived in an area where malaria is endemic, even if he has never to his knowledge acquired the disease. These facts must be borne in mind whenever the blood of one person is injected into another. It should be a routine procedure to inquire about possible malarial infection or residence in a malarial district before accepting anybody as a donor, and whenever possible such persons should not be used as donors Since this veto excludes all those who have lived in the tropics or in many subtropical countries, it may on occasion be necessary to vary it. Then the recipient should be kept under observation for a period of at least three months, so that the possible onset of malaria should be recognised early and the disease adequately treated

There appears to be some evidence that the risk of transmitting malaria by the injection of blood is greater if the recipient is a child Among the 29 recorded cases in which the age is stated, 15 of the patients infected were children under fourteen This may be due to particularly low resistance to infection in childhood The absence of symptoms in latent malaria must be partly due to increased resistance, but there also appears to be a lowered virulence of the parasites It is noteworthy that the father's blood in our case did not at first produce symptoms in the first patient with general paralysis of the insane into whom it was injected, and that the quartan parasites only began to appear in the patient's blood after he had also been given another type of malaria Also, when subsequently tested when parasites were demonstrable in direct films, there was again apparent failure to transmit malaria to two other adult patients

SUMMARY

An example is recorded of the accidental transmission of quartan malaria to a newborn infant by an intramuscular injection of blood, which proved fatal

It is emphasised that precautions must be taken to avoid this accident whenever the blood of one person is given to another. All those who have ever had malaria, even though they have been symptom-free for many years afterwards, or who have lived in malarial countries must be regarded as potential carriers of the parasites in their blood

It is suggested that infants and children are particularly liable thus to acquire malaria accidentally owing to low resistance In latent malaria the parasites are probably of low virulence and may be unable to infect adults, although young children may be susceptible.

We wish to express our thanks to Dr. E. A. Cockayne for permission to publish the clinical details of this case and to Dr. C. M Wenyon and the staff of the Horton Hospital, Epsom, especially Dr E. L Hutton and Mr. P. G. Shute, who carried out for us the tests and investigations on the blood of the donor.

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SURGICAL TREATMENT OF FACIAL PARALYSIS

A REVIEW OF 46 CASES

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The purpose of this communication is to give details of the successful treatment of cases of facial paralysis by the three methods devised by Duel, where the lesion causing the paralysis is situated in the fallopian aqueduct—i e, between the geniculate ganglion and the stylomastoid foramen The commonest causes are Bell's palsy and injury of the nerve during mastoidectomy The three methods are. (1) complete or end-to-end graft, where the nerve has been severed and a portion of nerve, taken elsewhere in the body, is used to bridge the gap, (2) inlay or side-by-side graft, used where some fibres of the nerve have been cut across or in other ways interfered with—e g, by scar tissue; and (3) simple exposure of the nerve and decompression by incision of the sheath, as in cases of Bell's palsy

The cases illustrated and described are taken from a series of 46 on which I have operated in the last three years and are typical of the successful results obtained Before describing the selected cases in detail, I wish to record some interesting facts which I have observed during the recovery of the muscle function In the great majority of the cases the muscles supplied by the lower branch of the facial nerve were the first to show signs of recovery. In the very early stage, if the patient were asked to show his teeth, there would be no obvious movement of the mouth on the affected side, but, if asked to try and close his eyes, although unable to do so, in the effort the zygomatic muscles would, quite obviously, draw up the angle of the mouth (fig 1*a*) This is curious, because in those cases in which recovery was practically complete, the eye closed normally, and symmetry was restored, the zygomatic muscles were the muscles which lagged behind This may, perhaps, be explained by the fact that the muscles supplied by the lower division have a much greater excursion than those supplied by the upper division Consequently, the lower-division muscles, when paralysed, are relaxed more than the upper-division muscles But this does not explain why the zygomatic muscles are usually the first to show signs of recovery, unless it be that the action of these muscles is entirely voluntary, whereas the action of some other muscles round the eye is almost involuntary or instinctive as well as voluntary, as in blinking, due to stimulation from the conjunctiva Later on, when recovery has reached a stage in which both upper and lower divisions are obviously working, the patient finds it impossible to dissociate the actions of the muscles, supplied by the two divisions, from each other If asked to show his teeth, the eye partially closes in the effort (fig 8*b*), and if asked

FIG 1—Case 1, six months after operation, some movement of the angle of the mouth on attempting to close the eyes

FIG 2—Case 1, thirty two months after operation, recovery complete, eye can be closed without any accompanying movement of the angle of the mouth (cf fig 1)

to shut his eyes and to frown, the angle of the mouth is raised (fig 1*a*)

These associated movements disappear in time, as recovery becomes complete (figs 5–8) Since the graft or decompression has been carried out in the trunk of the nerve in the aqueduct and re enervation is taking place from that point the fibres of both divisions should be affected equally In consequence, until recovery is complete, impulses travelling down the main trunk affect both divisions equally An infant can register only two emotions with its facial muscles—by laughing or crying—and in doing so it uses together all the muscles supplied by the two divisions When it grows older it can use a group of muscles independently of the others, as in raising one side of the mouth without the other This development of the various groups is carried on until, in adult life, the face can express a great variety of emotions, such as hatred sorrow, anger, affection, pain, or surprise of which a baby's face is incapable Some of us develop this separate movement of groups of muscles to a greater extent than others I can raise my left eyebrow without raising the right or contracting any other muscle of my face, but I cannot raise the right without raising the left Most people can only raise both together Nearly everyone can wink with one or the other eye, but they are unable, voluntarily, to close one eye without partially closing the other I can also move either ear independently at will, but ordinarily this movement is involuntary when I am listening carefully to a minute sound and corresponds to the "cocking" of the ears in a horse or dog All this appears to show that in these upper division muscles there is some involuntary or instinctive movement as well as voluntary Perhaps for this reason the muscles of the upper division show a more obvious and complete recovery earlier than those of the lower division

Treatment of the muscles during recovery should be restricted to manual massage with a view to stimulation of the blood supply Electrical massage causing contraction of the muscles, is contra indicated

FIG 3—Case 2, eight years after mastoidectomy, (*a*) the right eye is not completely closed, and the angle of the mouth is partly raised in the effort to close the eye (*b*) the effort to raise the angle of the mouth partly closes the right eye

FIG 4—Case 2, six months after graft, (*a*) right eye completely closed, without any accompanying movement of the muscles supplied by the lower division of the facial nerve (cf fig 3*a*) (*b*) increased movement of lower-division muscles as compared with fig 3*b*, (*c*) overaction of recovering muscles on the whole side of the face on whistling

FIG 5—Case 3 complete left facial palsy

FIG 6—Case 3, five months after graft

Electrical contraction of a muscle which is being re-enervated will very soon exhaust it Besides manual massage, I make my patient practise movements in front of a mirror for ten minutes two or three times a day, making the muscles of the unaffected side move only as much as the recovering muscles will move. This restores symmetry more quickly, which is the first objective Some patients, more enthusiastic than obedient, spend most of the day doing these exercises, and I constantly find one or other group of muscles in a state of fibrillation Electrical stimulation will produce this condition as well, and that is why I discourage it. The cases illustrated show that the results obtained by this method far exceed those of any of the older methods

FIG. 7—Case 4, complete right facial palsy.

CASE-RECORDS

CASE 1 —Complete or end-to-end graft in a woman, aged 51, with a history of complete mastoidectomy for right middle-ear suppuration of many years' standing by Hunter Tod in 1920. The posterior wound had healed by first intention, and there was no further suppuration until March 8, 1936, when she noticed otorrhœa and sudden onset of right facial palsy. On the 22nd a diagnosis of cholesteatoma and complete right infranuclear facial palsy was made.

At operation on April 6, 1936, the mastoid was reopened. No cholesteatoma was found. The appearance in the meatus was due to desquamated epithelium and meatitis, and the diagnosis was changed to Bell's palsy. I decided to decompress the facial nerve, and in exposing it I accidentally removed with bone forceps a portion of the nerve, 3 mm long, whereupon I identified and isolated the anterior femoral cutaneous nerve in right leg.

On the 30th I transplanted a portion of this nerve, now degenerated, to bridge the gap in the facial nerve.*

No photograph was taken before the operation, but the photographs shown in fig. 1 were taken on Oct. 26, six months after the operation, when it was obvious that there was some movement of the angle of the mouth when the patient attempted to close her eyes (fig. 1*a*). The photographs shown in fig 2 were taken on Dec. 1, 1938, by which time recovery was complete—i.e., thirty-two months after operation.

In later cases I have given up isolating the nerve and allowing the nerve-fibres to degenerate. The graft is transferred at the time of the first operation. This appears to work just as well and makes a second operation unnecessary. It will be noticed, also, that in fig 2*a* recovery is so complete that the eye can be closed without any accompanying movement of the angle of the mouth (cf fig. 1*a*).

CASE 2.—A girl, aged 12, had an acute right mastoiditis in 1930. Incomplete mastoidectomy with injury of the facial nerve caused complete facial paralysis. There was only partial recovery over a period of two years. The photographs shown in fig. 3 were taken on Jan. 15, 1938, eight years after the original operation, and demonstrate the amount of recovery. Fig 3*a* shows that the right eye is not completely closed, and that the angle of the mouth is partially raised in the effort to close the eye. In fig 3*b* the effort to raise the angle of the mouth partially closes the right eye.

Operation on the 25th consisted in decompression of the right facial nerve and inlaid or side-by-side graft. This was decided on because an end-to-end graft would have meant the loss of all recovery which had developed during the eight years since the original operation.

The photographs shown in fig. 4 were taken on July 28, 1938, six months after the graft was inserted. Fig. 4*a* shows the right eye completely closed, without any accompanying movement of the muscles of the lower division (cf. fig. 3*a*). Fig. 4*b* shows the increased movement of the lower-division muscles as compared with fig. 3*b*, and fig. 4*c* the overaction of the recovering muscles of the whole side of the face on whistling, as shown by the raising of the angle of the mouth and the eye being more closed than the left.

CASE 3.—A man, aged 24, with left otorrhœa for many years and sudden onset of left facial palsy on Oct 14, 1937. Photographs taken on Feb 14, 1938, show complete paralysis four months later (fig. 5). Bell's palsy due to infection spreading into the aqueduct from the middle ear or mastoid was diagnosed Operation consisted in simple decompression of the facial nerve, without graft Photographs taken on July 25, 1938, five months later, show the progress made (fig 6)

FIG 8—Case 4, five months after operation: (*a*) shows complete restoration of facial symmetry (cf fig 7) but (*b*) shows an associated action of orbicularis palpebrarum muscles on attempting to bare the teeth

CASE 4 —A man, aged 23, sustained a fracture of his skull in August, 1938, resulting in right facial paralysis without deafness or other intracranial symptoms He was referred to me by Mr. Northfield, who had had him under observation Photographs taken on Oct 17, 1938, three months after the accident, show complete facial paralysis (fig 7).

Radiography showed a linear fracture of the right temporal bone, which could not be followed into the petrous portion. Since, however, the lesion of the facial nerve was the only symptom, I concluded that the fracture involved the aqueduct; and so it proved.

On Oct. 17, 1938, I exposed the nerve but found no evidence of pressure or injury until I exposed the horizontal portion of the aqueduct, where it lies under the external canal of the labyrinth Here I

* This was my first attempt to do this and I wish to acknowledge my indebtedness to Professor Cairns, who helped me with this case, for his advice and encouragement

removed newly deposited bone which was blocking the lumen and pressing on the nerve It came away easily, and I then incised the sheath throughout its course in the aqueduct

Photographs (fig 8) were taken on March 27, just five months later, fig 8a shows that the symmetry of the face has been completely restored (cf fig 7a), but in fig 8b, on attempting to bare the teeth, there is associated action of the orbicularis palpebrarum muscle, hence the right eye is more closed than the unaffected left eye (cf fig 7b)

DISCUSSION

From the appearance of the nerve in cases of Bell's palsy there can be no doubt that congestion, due either to infection or to variation in temperature, is the cause of the paralysis by making the nerve swell in its bony canal The nerve fibres cannot convey impulses owing to the pressure, and paralysis results

In an effort to isolate an organism, Professor Bedson has investigated three cases for me in which there was no evidence of zoster infection in the way of skin eruption or involvement of the geniculate ganglion, and I am indebted to him for the report that there was no evidence of zoster infection in any of them

Four cases in the series have so far, shown no evidence of recovery One, the second in the series was a case of paralysis in a man aged 29, who had had long standing middle ear suppuration and was admitted as an emergency case of lateral sinus thrombosis and facial palsy After radical mastoidectomy, ligation of the internal jugular vein, and evacuation of the thrombus, he developed an osteomyelitis of the temporal bone and lost the outer table over a large area It was after his recovery from this that decompression of the nerve was attempted, and, in considering the case now, I feel that I should have been content with the fact that he was alive and should not have subjected him to further operation Another case was a palsy due to myoclonia This, too occurred early in the series, and the diagnosis of Bell's palsy was at fault The operation should not have been attempted Of the other two, one was a Bell which is unhealed still, nine months after decompression and infection may well be the reason why there is no recovery so far The other was a young woman aged 22, who had had a radical mastoidectomy in which the inner wall of the aditus and antrum was removed as a sequestrum An end to end graft was inserted but I doubt whether I was able to approximate my graft to the proximal end of the facial nerve, which would be about the position of the geniculate ganglion

All the other cases whether end to end side by side grafts, or simple decompressions, have recovered muscle function, some complete, some partial In the cases of partial recovery the patient is always most grateful for the loss of epiphora which seems to be a constant improvement in all of them Cases 3 and 4, in which recovery is complete are late in the series and I think it probable that this is the result of improved technique which is admittedly difficult, since I did my first case three years ago

The cases of Bell's palsy were selected from cases in which there was no evidence of recovery at all two months or more after the onset and the reaction of regeneration was present First evidence of recovery varied from a week to months after the operation In the cases in which partial recovery had taken place and then come to a standstill improvement was invariably slow Recovery in side by side graft took anything from three months to a year to show itself In the end to end grafts no evidence of recovery can be expected before six months, and probably not for a year

PICROTOXIN IN THE TREATMENT OF BARBITURATE POISONING

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ANÆSTHETIC REGISTRAR, MIDDLESEX HOSPITAL

Our interest in the treatment of barbiturate poisoning has been aroused by favourable reports from America on the use of picrotoxin as a physiological antidote An opportunity has recently arisen to enable us to put this method of treatment into practice The results have been so striking that we are encouraged to publish the case

Picrotoxin is a convulsant and appears to act as an intense medullary and cortical stimulant (Edmunds and Gunn 1936) Although it does not directly hasten the destruction of the barbiturate (Kline, Bigg and Whitney 1937) it effectively counteracts the hypnotic effects There is abundant proof that picrotoxin is superior to other possible antidotes in the experimental barbiturate intoxication of animals (Maloney, Fitch and Tatum 1931, Maloney 1933, Arnett 1934, Gower and Van de Erve 1933) but the effect of this drug is not yet widely known in man (Bleckwenn and Masten 1938) Since the first case of barbiturate poisoning treated by picrotoxin was published by Arnett six years ago only 21 have been recorded; of these 17 recovered and in the remainder life was manifestly prolonged

CASE RECORD

A married woman aged 35 was admitted to King George Hospital, Ilford, at 9 P M on May 6, 1939, having probably been in coma since the preceding night She had been found unconscious in bed that morning Although she lived in a doctor's house where supplies of barbiturates were freely available, there was no direct evidence of what preparation she had taken The diagnosis of barbiturate poisoning was made from the clinical appearance of the patient and was afterwards confirmed by the identification of this substance in her cerebrospinal fluid (cobalt nitrate and Millon's tests positive) Persistent albuminuria had been present following nephritis five years previously

On admission she was in a deep coma, very collapsed and failing to respond to any form of stimulus Stertorous respiration rate 25–30, pulse 120 temperature 99°F Skin dry and hot slightly cyanosed Mouth foul with dry sordes, Pupils contracted but reacting Deep reflexes suppressed Lungs clear B P 170 110 Retinal arteries constricted Other systems virtually healthy Freely incontinent Albumin in catheter specimen of urine

Until we were able to obtain the picrotoxin some three hours later the routine treatment for hypnotic poisoning was initiated This consisted of gastric lavage lumbar puncture, intravenous saline and intranasal oxygen However no significant change was observed in the patient's condition and she was still in deep flaccid coma when the treatment by picrotoxin was started This was given by intravenous injection in divided doses of 2·0 c cm of 0·4 per cent solution (1·0 c cm of which contains 3 mg) As can be seen from the following table the 'awaken' effect was rapid In less than three hours she

recovered sufficiently to ask for a drink of water and to hold the glass herself while she drank a tumblerful.

Date in May	Time	Picrotoxin (mg.)	Clinical condition
6	9 P.M.	—	Admitted to hospital. Deep coma (duration possibly 24 hours)
	12 MDN.	6	Respiration quickened and deepened after 2 minutes. Pulse slowed from 140 to 115, becoming fuller. B.P. unaltered
7	12 15 A.M.	—	Began grimacing. Becoming restless
	12 45 A.M.	6	Purposive movements of mouth, frontalis and orbicularis. Pulse 120
	12 50 A.M.	6	Stertor gone. Eyeballs rotating. Movement of mouth and lower jaw
	12 55 A.M.	6	Alæ nasi working. Still unable to respond to commands
	1 20 A.M.	6	Resentful of injection. Considerable movement of free arm. Beginning to cry intelligibly "I want to get up." Grip reflex present
	1 50 A.M.	6	Animated movements, followed by relapse into more restful coma as though tired. Jaw dropped. Pulse 110
	2 10 A.M.	6	No change. Still as though sleeping
	2 45 A.M.	—	After being pinched she stirred and asked for drink of water. Took glass, held it herself and sat up while she drank 10 oz.
	8 A.M.	—	Comatose again. Not easily stimulated to movement
	12 5 P.M.	6	Still lethargic
	12 25 P.M.	6	Restless
	12 45 P.M.	6	Became very restless after this. Muttering and sobbing. Speech not yet clear
	1 P.M.	—	Still lying with closed eyes but in answer to commands able to open them and protrude tongue. Taking drinks. T. 99·4° F., P. 115, R. 26
8	Throughout day	—	Rather drowsy but revived at times. Fairly restless. Somewhat tearful. Able to take solid food and drinking well. (Intravenous saline discontinued.)
9	et seq.	—	Completely resuscitated. Cheerful. T. and P. normal. B.P. 125/75
16	—	—	Discharged home. No sequelæ when last heard of two months later

DISCUSSION

It will be noticed that the picrotoxin was at first given intermittently for two hours until the patient had been fully stimulated into effectual restlessness. For the next ten hours it was discontinued until a gradual relapse required a further 18 mg. In the intervening hours and subsequently, until 10 P.M. two days later, 4 c.cm. of Coramine was injected intravenously at two-hourly intervals. A total of 54 mg. of picrotoxin and 112 c.cm. of coramine were given. It must, however, be emphasised that the effect of the picrotoxin after every injection was dramatic and obvious whereas no remarkable result was evidenced at any time from the coramine. Further, coramine was entirely withheld until the patient had been revived initially by the first 36 mg. of picrotoxin. It was then given for economic reasons in an attempt to sustain the favourable effect of the picrotoxin. It was quite clear to us that the observed effect of picrotoxin in this case could not possibly be confounded with that of the other remedies used.

After each injection of picrotoxin a latent period of one to three minutes preceded the signs of response. The reactive irritability would reach its peak after several minutes then to subside if no injection immediately followed, leaving the patient again in coma. The effect of this temporary stimulation was each time to lighten the degree of coma into which she would afterwards lapse, so that narcosis became successively shallower. It is possible that we could have prevented these relapses by administering picrotoxin more frequently or in bigger doses. Nevertheless we felt that so long as we were able to keep our patient restless, thereby increasing her pulmonary ventilation, we could considerably reduce the danger of the most serious complication of barbiturate poisoning, namely, pneumonia. This, indeed, we effected and in the majority of the recorded cases pulmonary complications have been similarly avoided.

The problem of dosage remains controversial (Rovenstine 1938) but it would seem that far larger therapeutic doses are both possible and safe. The dangers of overdosage of picrotoxin in barbiturate poisoning have conceivably been exaggerated but it may be borne in mind that over-stimulation can produce convulsions which in turn are followed by increased depression. We gained the impression from this case that had it been more severe we could with impunity have given larger doses of the drug. Previous reports have shown that heroic therapeutic doses can be tolerated which are many times greater than the lethal dose of picrotoxin. It is, therefore, of vital importance only to employ this potent antidote in cases where the diagnosis of barbiturate poisoning is certain. Intravenous picrotoxin should be given continuously until spontaneous movements, restlessness and a substantial decrease in the coma are apparent. After this intramuscular injections may be sufficient to sustain the stimulatory effect (Kohn 1938). As a precautionary measure Evipan or Pentothal should be kept ready as a rapid antidote to an overdose of picrotoxin. Bleckwenn and Masten have advocated a dosage at the rate of 1 mg. per minute and Murphy et al. (1937) have suggested an initial 5 mg. which can be doubled after twenty minutes, continuing with smaller doses of 2–5 mg. until the patient emerges from coma. The largest dose recorded without ill effect was 2134 mg. in a single case (Rovenstine). We venture to predict that in the future the specific value and comparative safety of picrotoxin in preventing death from barbiturate poisoning will be abundantly confirmed with the experience of further clinical trials.

CONCLUSION

Picrotoxin, a violent convulsant poison, can be used with safety in relatively large doses in barbiturate poisoning wherein it has proved to be dramatically effective in saving life.

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A congress on Nutrition and Education will be held at British Medical Association rooms, Edinburgh, on Saturday, Oct. 14, under the auspices of the Scottish Committee against Malnutrition, which was formed a year ago by a group of doctors. There will be an afternoon and evening session and it is hoped that Sir Robert Greig, D.Sc., will take the chair. Sir John Orr, F.R.S., director of the Rowett Research Institution, Aberdeen, will be one of the speakers. The main subjects for discussion will be existing nutritional conditions as compared with minimum health requirements, and malnutrition as it affects education. Further information can be obtained from the hon. secretary, 111, Trinity Road, Edinburgh.

MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SECTIONS OF SERVICES AND TROPICAL MEDICINE AND PUBLIC HEALTH AND HYGIENE

At a joint meeting of these sections, with Lieut.-General Sir WILLIAM MACARTHUR in the chair, a discussion was held on

Leptospirosis

Prof. L. S. P. DAVIDSON (Edinburgh) said that of the 248 accurately diagnosed cases of Weil's disease in Great Britain, 109 have been in fish workers. Furthermore, serological tests of 210 apparently healthy fish-workers showed that 24·3 per cent. had been infected, whereas tests of 406 controls not engaged in this industry were all negative. Infection takes place in three grades: (1) mild with symptoms insignificant or absent, (2) moderate with influenzal symptoms and no apparent jaundice, and (3) severe. The illness begins suddenly with headache, vomiting, generalised muscular pains and fever. Conjunctivitis ("pink eye") and albuminuria with cells and casts are helpful in diagnosis, but jaundice rarely appears before the third day and a diagnosis of influenza is usually made. If jaundice has not appeared by the second week the case is mild and symptoms rapidly abate. In moderate cases fever declines during the second week but jaundice and toxic nephritis are more prolonged. In severe cases convalescence may be long and there may be a secondary rise of temperature during the third week. In unfavourable cases jaundice steadily increases, the urinary output falls, blood urea rises, hæmorrhages take place, and the falling blood pressure and mounting pulse indicate the gravity of the situation. In the Aberdeen series the mortality was 5·7 per cent., about half that in Holland, and the favourable figure was probably due to the high incidence among healthy girls in the fish industry. The prognosis becomes progressively worse with increasing age and particularly in alcoholics, fatal cases usually die between the eighth and tenth day. A neutrophil leucocytosis of 10,000–30,000 is characteristic, and in severe cases anæmia and thrombocytopenia may be marked. The icterus index is raised and the blood urea usually increased high values being of serious significance although cases can recover despite a high blood urea. In Aberdeen 10 per cent. of cases showed evidence of meningitis but all recovered, the protein of the spinal fluid was increased, there was a pleocytosis, at first polymorphonuclear and later becoming lymphocytic, specific agglutinins were demonstrated in the fluid in each case but in no instance were leptospiræ isolated. Antileptospiral serum in doses of 10–20 c.cm., repeated in four to six hours as required notably reduce toxæmia and mortality when given early but after the seventh day the beneficial effects are less marked. Alkaline mixtures are of value for the gastritis and to facilitate urinary excretion. In view of the hepatic and renal damage fat and proteins are restricted and a diet rich in carbohydrates is given, plenty of fluid with glucose seems to be beneficial. Simple precautions that were suggested to the fish industry in 1934 appear to have been disregarded.

Dr. JOHN SMITH (Aberdeen) discussing laboratory diagnosis said that during the first week of the disease the serum can be tested for agglutinins and the clot inoculated into guinea-pigs or culture medium for isolation of the organism. During the second week the agglutination and lysis tests are valuable while from the second to the fourth week organisms may be detected directly or by inoculation in freshly passed urine. He has found leptospiræ in patients' blood by guinea-pig inoculation in all cases up to the fourth day, but only in exceptional cases after the seventh or eighth day. Agglutination reactions are negative before the third day but positive in all cases by the ninth day. In only three instances were leptospiræ isolated from blood showing agglutinating power, but in these cases the titre was 1–30 or less. In four cases when first examined between the fifth and eighth day neither organisms nor agglutinins were demonstrated and such cases may be misleading without further examinations. Leptospiræ were never recovered from the urine during the first week, the maximum success (21·5 per cent. positive) being obtained in the third week, and all were negative again after the fourth week. Agglutinins, probably excreted in association with euglobulin, are sometimes demonstrable in the urine of convalescent patients. Many years after infection cases may still have high agglutination titres in the blood, 15 out of 47 fish workers who had a history of jaundice gave a positive test, 18 out of 48 who had only suffered from a febrile illness were positive, and 18 out of 145 with no history of disease were found to have positive titres. It seems impossible, he said, to keep the premises free from rats but washing down each morning with a hose, the use of hypochlorite disinfectants and greater cleanliness would reduce the incidence of the disease in fish workers.

Dr. J. M. ALSTON (London) discussed the cases seen during the last five years in London sewer workers, the therapeutic effect of antiserum and the prophylactic measures employed. Each worker is given a card drawing attention to methods of hygiene and the importance of proper treatment for cuts and minor injuries. In the event of any illness the card can be shown to the workman's doctor, so that the possibility of Weil's disease may be realised, and this results in men being sent earlier to hospital. Errors of diagnosis by agglutination reaction in cases that have previously received antiserum seem improbable since rabbits given antisera show a rapid fall in titre below the theoretical values that might result from the doses given. False positive reactions may be obtained in the macroscopic agglutination test where formolised antigen is used.

Dr. T. FERGUSON (Edinburgh) said infective jaundice was made notifiable in Scotland in 1924 following an outbreak among miners in East Lothian. Some 558 cases have been notified but many of these, particularly the earlier ones were found to be catarrhal jaundice, although more than 200 cases of Weil's disease were confirmed. Of the latter 9 were children, probably infected in rat-infested streams, of the remainder 62 were coalminers from wet rat-infested pits especially in Lanark, Fife and the Lothians, 92 were fish workers in Aberdeen, 9 were sewer workers, and several were farm workers. In 1926 a departmental committee set up by the Home Secretary reported that Weil's disease might properly be scheduled as an occupational disease under section 43 of the Workmen's Compensation Act subject to certain conditions, the chief of which was that the diagnosis should be confirmed bacteriologically or serologically. So far the disease has not been added to the schedule but a decision of the court of session

in Scotland in 1926 held that it may be regarded as an industrial accident, and as such is covered by the Workmen's Compensation Act.

Dr. F. MURGATROYD (London) thought anti-leptospiral serum ought to be given immediately there is reasonable probability of Weil's disease even while awaiting laboratory confirmation, as in the early stages it is impossible to forecast the course of the infection. Suggestive clinical features are muscular tenderness, conjunctival injection and polymorphonuclear leucocytosis, particularly in those exposed to risk of infection. Syndromes with influenzal, meningeal, pulmonary or even abdominal symptoms have occurred and consequently in any obscure fever Weil's disease should be considered. In isolating leptospiræ from the urine by animal inoculation or culture greater success is obtained if the urine is first made alkaline by giving the patients alkalies, as the organism appears to die rapidly in acid urine. Comparable to this is the fact that in Queensland the epidemics of Weil's disease among the cane-cutters arose chiefly after the heavy rains which reduced the normal acidity of the soil and so assisted the survival of leptospiræ deposited by the rats. As a method of prophylaxis vaccination appears successful in animals but less satisfactory as a practical procedure for man.

Dr. R. D. STUART (Glasgow) said that in the West of Scotland miners, tripe-scrapers and sewer-workers are the groups chiefly affected. The incidence in miners appears to be about 1·5 per cent., but there is evidence to suggest that considerable epidemics have occurred in certain pits. Recently the disease has been found among labourers in the beet-fields in West Cork. Among tripe-workers the cases were mainly mild but all the illnesses were severe among the sewer-workers. As the majority of cases are misdiagnosed in the early stages the occupational risk should be more widely recognised and all "atypical influenza" cases considered suspect. Where infection is localised and severe, as in sewer-workers, vaccination should be considered, and for all cases anti-leptospiral serum should be immediately available.

Dr. J. J. PATERSON (Maidenhead) asked how the leptospira gained entrance to man. Dr. P. H. MANSON-BAHR (London) said the spleen is not usually enlarged in Weil's disease; he also suggested rubber gloves to protect the fish-workers. Prof. J. W. MCNEE (Glasgow) thought that during the late war infection of the soldiers took place through the alimentary tract. He has not found the spleen enlarged, and he said that hæmorrhagic herpes, when present, is a valuable diagnostic sign.

Professor DAVIDSON replied that fish-workers are probably infected through abrasions on the hands but he does not think gloves would be feasible. He agreed that splenomegaly is not a feature of the disease. Dr. Smith followed Schuffner's technique in the agglutination test; for the detection of the organism itself he preferred animal inoculation. He suggested that cases might be looked for among the fish-workers of Grimsby and Hull. General MACARTHUR, closing the discussion, said that more careful examination would reveal a greater proportion of cases without jaundice, as they are probably now being overlooked. Jaundice is no more necessary for the diagnosis of Weil's disease than is a rash for the diagnosis of typhoid.

Sero-Diagnosis of Enteric Fevers

Lieut.-Colonel J. S. K. BOYD (R.A.M.C., London), a short paper, pointed out that the usual serological methods for the diagnosis of enteric fevers are not entirely satisfactory. In subjects previously inoculated with typhoid-paratyphoid vaccine various febrile conditions may produce anamnestic rises of H-agglutinins indistinguishable from those due to actual infection, while in true infections the O-agglutinins, although more specific, sometimes develop so sluggishly that a diagnostic rise is not obtained. Tests for Vi-agglutinins, only applicable at present to *Bact. typhosum* infections, were originally complicated owing to instability of the antigen, but an alternative technique has now been provided by the discovery of strains of *Bact typhosum*, devoid of H- and O-antigen and possessing only Vi-antigen, which can be preserved as standardised formol suspensions. Vi-agglutinins have an important diagnostic significance in the early stage of infection but after the first week they disappear in many cases; they are also important in the detection of permanent carriers but may be absent in convalescent carriers. An important advance is the discovery of bacteriophage having a specific action on virulent strains of *Bact typhosum*. Four serological types of such Vi-phage have been differentiated, one of which, type II, readily becomes conditioned specifically against various strains of *Bact typhosum*; in this way thirteen phage-types of *Bact typhosum* have been distinguished. These phages offer a simple means for typing unknown strains; a number of spreads on agar plates of the bacterium to be tested can be spotted with drops of the various conditioned phages in standardised dilution and the specific lytic effect observed. The phage type of the bacterium remains constant, being unaffected by passage through man, experimental animals or culture, and the test is of value, for example, in linking up an outbreak with a particular carrier, or in determining the source of an individual infection.

Dr. R. D. STUART (Glasgow) asked whether continued fevers in India due to salmonella infections might not give confusing O-agglutination results, and Prof. C. P. BEATTIE (Iraq) stated that O-agglutinins may be found up to a titre of 1 100 in normal persons and may also develop after T.A.B. inoculation. Dr. P. H. MANSON-BAHR (London) said that during the war the H-titre in inoculated persons was found to rise during an attack of malaria. Dr. J. M. ALSTON (London) asked whether virulence varies with phage-type and whether supplies of bacteriophage are available and easy to maintain.

Replying, Colonel BOYD said salmonella infections are relatively unimportant as they are few and far between in India. He agreed that O-agglutinins, and sometimes Vi-agglutinins, may develop after T.A.B. inoculation. Phage-types of *Bact. typhosum* have not shown any antigenic differences in animals. Phage is easily propagated and preserved, and only minute amounts are required for a test.

A popular lecture, illustrated by lantern slides, was given in the afternoon by Dr. P. H. MANSON-BAHR entitled "Aberdeen's gift to tropical medicine—Sir Patrick Manson."

" At Birmingham station I became a modern Englishman, enthusiastically proud of modern England's science and energy; that station alone is enough to make one proud of being a modern Englishman. Oh, what an idea does that station, with its thousand trains dashing off in all directions, or arriving from all quarters, give of modern English science and energy."—GEORGE BORROW, Wild Wales, 1862.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations Each contributor is responsible for the section for a month, his name can be seen later in the half yearly index

FROM D P M

I

WHAT with the advance of scientific and the decay of clinical medicine the only refuge of the patient nowadays seems to be Christian Science Laboratory workers have certainly come into their own in this generation, and the result has been the coining of the phrase "clinical material" I doubt whether it makes for good medicine to think of people in this light, I fancy it must have been responsible for the experience of rather a weedy youth I know who went into hospital to have a pain in his belly investigated He was there four days and suffered the following traumata two barium enemas and several of the ordinary variety, a barium meal, a pyelography, a test meal, the tube being passed not too cleverly by the nurse, and two or three blood examinations, the blood being collected not too cleverly by the house surgeon And then of course there was the psychic trauma of the bill He went in weedy and came out looking like a weed which has attracted the unfavourable attention of the gardener I am not saying that the tests were unnecessary, though most of the results were conflicting, they served to clear the ground, but I do suggest that they might have been spread out a little and conducted with more humanity The distinguished laboratory and radiological workers who had charge of this bit of clinical material might have looked in now and then to see whether the victim was equal to the next assault Or just to pass the time of day

* * *

Why is clinical medicine at such a discount today? In many fields the criterion of skill has become, not a capacity to make the patient comfortable, but a capacity to pass examinations—surely an extraordinary standard Unfortunately it is a standard which has been adopted largely in the public services, where lay committees have no guide to ability other than a string of letters, and no first hand knowledge of the people they are appointing It comes about, in these services, that promotion depends upon the number of qualifications, much as promotion for a policeman depends on the number of convictions he secures Under this system honest doctors find themselves collecting degrees with the abandon of a boy-scout collecting badges Any number can play at that game, and before you know where you are, M R C P's are three a penny A harmless enough pastime, some say, but the trouble is that a man who is continually working for examinations has less time to be a good, observant considerate doctor He is continually hurrying away from his patients to get at his books Of course if he succeeds in his design this does not matter very much he is made a superintendent and never practises medicine again He spends his life wrestling with laundry machinery drug bills, lavatory accommodation and air raid precautions What a fate for a promising young doctor! Still once he has got to the top he is out of mischief, it is while he is climbing that he is a menace Fortunately there is always a residue of doctors too wily or too lazy to take the bait The patients like having them about

* * *

Visitors to institutions for mentally defective children walk through two wards as a rule before uttering their slogan "What you need is a lethal chamber" Of late they have been able to vary it with another agreeable formula "What you need is a well placed bomb"

There is a working chance that their second suggestion may be put into practice, since mentally defective, unlike physically defective, children will not be evacuated in case of war It seems there is nowhere to put them This is bad luck for them, because they are as easily frightened as normal children and rather less easily reassured The historical attitude of most people towards the fate of mentally defective people strikes me—nowadays—as odd At one time I shared their opinion and advocated euthanasia with the best, but that was before I had had much to do with mentally defective patients Even after a month or two in the wards I was pretty cocksure, but little by little I found where I was wrong The easy superiority of the eugenist deserted me, for I found that I was dealing, not with regrettable accidents but with people—and uncommonly nice people at that

After five years of their society—and the time has been spent among low grade defectives, idiots and imbeciles—I know that if someone presented me with a fine new lethal chamber and authority to use it I should have extreme difficulty in choosing even one victim On what grounds ought the choice to be made? Mere lack of intelligence seems a dangerous standard Many high grade defectives—feeble minded patients and the more able imbeciles—would not be noticeably deficient if placed among simple or savage people, they would do pretty well It seems unreasonable to say that if they had been born scions of a race of savages they would be fit to survive, but that having cropped up in a civilised country they merit death

Moreover it is hard to be sure that the value we set on intelligence is justifiable Intelligence is all very well in its way, it is a useful and sometimes even an agreeable quality but it is only one human quality among many, there is nothing sacred about it Many other qualities have as much, if not more, social value—humanity, candour, reliability thoroughness, to name a few Mentally defective patients often score over normal people in just such attributes, most of them are kindly, innocent easily contented, easily amused and willing to work endlessly at a dull job without losing interest Of course there are exceptions, there are cross grained, difficult, hysterical and deceitful patients just as there are normal people with similar defects of character, but on the whole they are good citizens

The favourite argument for euthanasia, however, is that the mentally defective person cannot earn his keep—he is an economic drag on society and therefore useless This seems an unbalanced argument, for who is useful otherwise than relatively? Who is indispensable, except to himself? Stella Benson summed up human value when she said "An un

natural accident is happening to a noble and unreplaceable cockroach—me!"

The most able of us is no more than a temporary stop-gap, society will get on well enough without us when the time comes. But apart from that, how many people are really as valuable to society as a mentally defective patient contentedly making rugs or shoes or furniture in an institution? How does one assess the social value of a leisured woman living at the expense of a wealthy husband? Or of an impecunious neuropath supported by his friends? Or of an idle young man who spins out his education interminably and never qualifies for a profession? Or of artists indulging their creative instinct gloriously, openly contemptuous of the opinions of society, and anxious only to serve an animistic conception called art? As far as I know the lethal chamber has not been recommended for any of these

The truth is that when it comes to picking our friends we care very little about either intelligence or usefulness—we pick them for more human qualities, often for the qualities found so commonly among the mentally defective. Probably the reason that so few people number certified mental defectives among their friends is that they have no opportunity of meeting them socially. As far as I can see the only patients who would benefit by euthanasia are those helpless idiots who can do nothing for themselves and who are miserable in addition. There are not a great many of these available.

* * *

This war-today-and-none-tomorrow system under which we are living must have curious effects on the endocrine secretions; some of our keener laboratory workers are probably measuring them by this time. Just as the tide of adrenaline has surged through our blood-stream someone in Europe begins another conversation, and the tide is turned off at the main, giving place to relief tempered by a flat-soda-water feeling; no sooner has normal life recovered its true importance than we are called upon to face another crisis. The pathetic speed with which we make the adjustments suggests the fancy that we ourselves are the victims of some super-laboratory-worker engaged in a nicely graded series of experiments. It is not difficult to picture mankind as a group of protozoa under the microscope; someone introduces a drop of weak acid under the coverslip and we flee from it in an angry tide, then he changes the reaction and we flow back blindly, obeying a simple chemical change.

European politics in the last year have become too fantastic for parody, and the swing of opinion in this country has had its amusing side too. Two years ago most of us believed that war should never again be regarded as an argument; intellectually, perhaps, we believe it still, but we have been gradually cozened by changing circumstances—by an alteration in the reaction of the fluid if you like—into feeling it is the only argument left to us. Psychologists say that to be able to forgo without fuss is the hall-mark of adult behaviour, it is also the usual behaviour of very simple animals like the amœba. After centuries of evolution, then, we can boast that the best of us are prepared to submit to our fate as meekly as our first ancestor. We don't seem to have put in the time very well.

Quarterly Journal of Medicine

THE July issue contains the following papers.—

THE CEREBRAL BLOOD-FLOW IN ARTERIAL HYPERTENSION, ARTERIOSCLEROSIS AND HIGH INTRACRANIAL PRESSURE. By Denis Williams and William G. Lennox (Boston). Arteriovenous oxygen and CO_2 differences (using internal jugular vein blood) were determined in groups of patients with these conditions, and in patients with normal intracranial circulation. With one exception no significant abnormalities were found in any group. This indicates that in arterial hypertension (even in one case with severe congestive cardiac failure), in raised intracranial pressure (even in comatose cases), and in cerebral arteriosclerosis, the cerebral blood-flow remains within normal limits. The exception is the cerebral arteriosclerosis group, in which the mean cerebral blood-flow, though within normal limits, is low, indicating mechanical limitation of the vascular bed.

THE EFFECT OF PITUITARY THYROTROPIC EXTRACT IN SUBJECTS WITH LOW BASAL METABOLIC RATES. By E. P. Sharpey-Schafer and I. Schrire (British Postgraduate Medical School). Intramuscular injection of pituitary thyrotropic extract produced clinical changes, increased creatine excretion, and increased basal metabolic rate in every one of twenty-two normal subjects, and in five subjects with various endocrine disorders. It was without effect in three myxœdematous patients and one cretin, also in three subjects with low basal metabolic rates, but without other myxœdematous features. These three all showed evidence of hypogonadism, one of them was proved by biopsy to have a normal thyroid gland.

THE TREATMENT OF CHRONIC HYPOPARATHYROIDISM. By Ian A. Anderson and Alexander Lyall (Aberdeen). Calcium and phosphorus balance experiments on three cases of postoperative hypoparathyroidism are reported. In all three the serum calcium could be raised to and kept at a normal level by a diet low in phosphorus, supplemented by a large addition of calcium (as calcium lactate). A similar calcium intake, without restriction of phosphorus, was without effect. The mechanism of the effect, which is of obvious therapeutic value, is discussed.

THE DIFFERENTIAL DIAGNOSIS OF FORMS OF BASOPHILISM (CUSHING'S SYNDROME), particularly by the Estimation of Urinary Androgens. By A. C. Crooke and R. K. Callow (London Hospital and National Institute for Medical Research). Four cases are described. In two a malignant adrenal cortical tumour was found, after being palpated in one case and demonstrated in the other by radiography after perirenal air sufflation. The urine of these two gave high values in the colorimetric assay of 17-ketosteroids or in the biological assay of androgens, that of the other two, in whom no adrenal tumour was present, gave low values. These urinary assays are claimed to give valuable help in the differential diagnosis.

THE CAUSATION OF THE LOW BLOOD SUGAR IN CŒLIAC DISEASE. By Theodore Crawford (Glasgow). The blood sugar curves following intravenous injection of 0·5 g. glucose per kg. body-weight, in twelve cases of cœliac disease, were similar to those in normal children, eleven of the cases gave low curves after oral administration of glucose. This points to defective absorption from the gut as the explanation of the low blood-sugar levels in this condition. Six of the cases also gave normal blood sugar curves after intravenous injection of insulin.

RHEUMATIC HEART-DISEASE AS MET WITH IN HOSPITAL PRACTICE IN CEYLON. By P. P. Fernando (Colombo). Post-mortem findings over a period of 3½ years are compared with statistics from Guy's and St. Mary's Hospitals, London; the incidence and general features of rheumatic carditis are about the same in the Ceylon series as in those from London. A survey of the clinical features of the rheumatic infection, as seen in one group of wards in the same period, shows no important difference (except the absence of nodules in Ceylon) between the disease as seen in Ceylon and the disease as seen in temperate climates.

THE LANCET

LONDON SATURDAY, SEPTEMBER 2, 1939

A PEACE OF UNDERSTANDING

We have been witnessing a political degradation The German people—our cousins in blood, our fellow-workers in science, and often our friends—have been drilled to believe evil of their neighbours First the Czechs and now the Poles are accused of malign intentions against the Reich, and their evil mounts higher and higher according as the German preparation for their destruction advances When such accusations are made by individuals psychiatrists call the process "projection" They regard it as a dangerous symptom, while jurists have always held that such behaviour should be handled by the police and with due process of law Likewise the world today, less inclined than formerly to be lenient to the antisocial tendencies of nations, holds that if a nation goes wrong in this way it should be checked

The knowledge lately gained of the disorders of the mind may help in the restoration of order in Europe When a person attributes to another the evil within himself his purpose is not simply to preserve the illusion that he is blameless and peaceable, it is also, unconsciously, to preserve a cherished object or ideal from attack We must recognise that in the German people today there are forces of devotion, loyalty and passion which rise above the self and demand an allegiance superior to the claims of comfortable living Unfortunately, high ideals in an individual or nation may be associated with serious antisocial tendencies We are coming to recognise in our patients the complicated inter-relation of these two elements, and in national affairs we shall find it no less difficult to give full weight to the power of knowledge, for we must first put our own fears and counter-hostility aside Yet if we want truth and peace and liberty to think we must give ourselves to the task which truth and peace and liberty of thought demand of us

Nations judge themselves by their war aims, posterity judges them by their manner of offering, making, accepting and keeping the terms of armistice and peace A brutal and antisocial force is at work in Germany today, destroying the peace of Europe, and, whether we know it or *ignore* it, we too are at the bar of History We in England are united as seldom before in a common cause—to stop power being used for private ends We have that access of power, as for the moment has Germany, which comes from the canalising of action in a single purpose But its strength will be largely wasted, as was that of the last war, unless we use it rightly Unless we keep the aim of our struggle and the conditions of peace in full view all the time we shall be like harassed relatives holding down a dangerous patient till from exhaustion he submits—for the moment As psychiatrists we have given up the use of chains, though not always the use of locks, as peace-holders of Europe we must avoid the notion, too prevalent a quarter-century ago, of crushing Germany out of existence or of hanging the Kaiser As psychiatrists we know the domestic war of nerves to be the climax of a prolonged inner conflict and disquiet in the patient, and if we are good psychiatrists we shall recognise the harm done by our own mistakes To deal with the disruptive force of this kind of aggression we need a moral courage to face the evils in our own human nature

Doctors have little to do in war except to mend the injuries done by aggression, but they may take comfort from the belief that their discoveries can do more than anything else to remove the burden of war Today such a boast may seem strange, yet now of all times it ought to be made true For we must not forget—nor let others forget—what we have learnt from clinical work The physician's power to control disorders of the mind depends on the patient recognising him as an open-minded and human creature who can be trusted to deal with him fairly Our propaganda will be powerful for peace in proportion as it carries the conviction of our moral capacity to make a good peace A war of silent hate would be long and destructive of our lives and our own ideals The will to achieve a lasting peace must include an open-minded willingness to listen to complaints and meet grievances, remembering that the peoples of Europe will have to live as neighbours to the end of time

MARIHUANA

An old vice in the new world has in the past three years become something of a sociological problem Cannabis indica has been indulged in for thousands of years and under the names of hashish or bhang it is still used extensively in the near east and especially Egypt by the so called criminal classes In India chronic psychoses due to hashish are extremely common In the Bombay mental hospitals[1] last year, cannabis indica psychosis accounted for about 12 per cent of all admissions Lately the vice has spread among lazy and dissolute adolescents in the USSR, the plant having been introduced by way of Turkestan and the Caucasus In Mexico the drug is known as marihuana, a corruption of the Portuguese "marguango" meaning intoxicant Its picturesque synonyms in the United States, whither it is smuggled from Mexico, include muggles, *reefers*, Mary Warner, Indian hay, the weed and tea The hemp plant is cultivated for fibre in the mid West and also grows wild throughout the USA The dried flowering tops are rolled into cigarettes In New Orleans and in other parts of the States pedlars sell these cigarettes in clubs, cabarets, and restaurants The younger generation are apparently the chief smokers and even boys and

1 Annual Report on Mental Hospitals in the Bombay Presidency, 1938, Bombay, 6d

girls pay a nickel for two mootas or marihuana cigarettes and hysterical states known as "laughing jags" are not uncommon. Marihuana in all its aspects has recently been described by Prof. R. P. WALTON [2] His book is the most complete monograph on cannabis indica intoxication and is comparable with MAIER'S [3] study on cocainism, ROUHIER'S [4] on mescalism, and that of TERRY and PELLENS [5] on opium

Marihuana from the psychiatric point of view appealed frequently to the romanticists of the nineteenth century DUMAS, GAUTIER, BAUDELAIRE and DE QUINCY, and such Americans as BAYARD and HECTOR FRANCE have given vivid descriptions of the mental changes induced by the drug Recently BROMBERG [6] has investigated marihuana in New York His study is based on material seen in his capacity as psychiatrist to the Court of General Sessions and the Bellevue Hospital. He is sceptical as to whether marihuana really causes its addicts to commit rape, suicide, and murder, as the popular press in America allege He even casts doubts on the drug's habit-forming capacity Tolerance does not appear to increase, and there are no demonstrable withdrawal symptoms. In 67 cases involving marihuana seen at his court it was found that early use of the drug did not predispose to crime and no single positive piece of evidence showing the relation between marihuana and sexual or violent crimes came to light Countless people use marihuana without developing any observable mental upset and, as is the case with alcohol, the essential factor in the development of a marihuana psychosis appears to be the personality of the patient

The marihuana psychosis occurs in two forms, acute intoxication and a more enduring toxic psychosis Acute intoxication lasts a matter of hours or days Its features are euphoria often associated with anxiety and apprehension, depersonalisation and upset of time appreciation Dance-band musicians are said to use marihuana to produce an apparent slowing of the tempo of their music, thus enabling them to play fast passages easily when improvising on a theme There are feelings of bodily change such as lengthening of the limbs and swelling of the head Sometimes the confusion is associated with visual illusions and hallucinations The toxic psychosis lasts for weeks or months and is often superimposed on schizophrenia or some other mental illness. Indeed, it appears that marihuana is merely a trigger which releases a latent insanity

In the interest which marihuana addiction has aroused in the States credulity appears to have outrun science The press and stage have exploited it and it even formed the theme of a cinema film, Assassin of Youth." To the enthusiasts who see in marihuana the hand of Satan, BROMBERG'S work provides a healthy corrective. The only final conclusion which he allows himself to draw is that marihuana is a sensual addiction in the service of the hedonistic elements of the personality.

MILITIAMEN AND TUBERCLE

THE death of a militiaman from pulmonary tuberculosis, a few weeks after having been placed in grade 1 by a medical board, raises again the question of the advisability of including radiography of the chest in the routine examination of these young men This militiaman was re-examined and passed as fit on joining his unit on July 16, on the 29th he was sent to hospital for two days' observation, after an attack of dizziness; he returned to duty but collapsed during drill on Aug 19, and died almost at once. Post-mortem examination showed extensive cavitation in both lobes of the left lung.

Pulmonary tuberculosis still accounts for about a third of the total deaths of young adults from disease, and the incidence of significant lesions found radiographically in so-called healthy persons is variously reported as from 0 5 to 2 0 per cent. This would mean 1000–4000 out of the 200,000 annual recruits for the militia. In Parliament in June Sir VICTOR WARRENDER [1] said it was beyond the wit of the medical profession to ensure the discovery of latent disabilities before a militiaman is passed into the army, and there can be no doubt that with only physical examination, however carefully carried out, a serious number of cases of early phthisis will be missed Mass surveys in the United States, France and elsewhere have demonstrated that in this respect routine radiography will give a much higher proportion of accurate diagnoses Thus, of some 25,000 candidates for employment in the French state railways in the years 1935–37, about 1·2 per cent were discarded on radiological evidence after being passed as sound on physical examination

The ascertainment of early cases among militiamen is important enough for the recovery of the patients themselves; but it is doubly important for the sake of those with whom they will come in close contact during their training The compulsory medical examination of all prospective state employees in France includes screening of the chest and radiography where the screen findings are suggestive. A similar procedure for militiamen would require a large supply of expert radiographers, and would not provide any permanent record, other than a written report, in every recruit's dossier. The cost of a celluloid film for each recruit would be high, and in a full-sized paper radiogram, which is cheaper, a significant amount of detail is lost through the coarse grain of the paper. As suggested in these columns on June 10 (p. 1330), the miniature radiogram, in which a small photograph is taken of the fluorescent-screen image, combines a high standard of accuracy with a cost of less than a penny per recruit. The miniature radiogram can be examined by the expert at leisure, and four such experts would have no difficulty in dealing with 200,000 recruits a year. The method could be applied even to the flood of

2 Walton, R. P., Marihuana: America's New Drug Problem, London, 1939 pp. 223 12s 6d
3 Maier, H. W., Der Kokainismus, Leipzig, 1926
4 Rouhier, A., Le Peyotl Paris, 1927
5 Terry, C. E., and Pellens, M., The Opium Problem, New York, 1928
6 Bromberg, Walter, *J. Amer. med. Ass.* July 1, 1939, p. 4.
7 Produced by Leo J. McCarthy, Hollywood, 1937

recruits in war-time It is already in use in Germany, largely owing to the technical progress made by R JANKER A satisfactory apparatus, of which the cost is not prohibitive, has been described in THE LANCET by DORMER and COLLENDER,[2] and it would be a wise step for the proper authority to make a close study of technique and working details and to select a panel of diagnosticians—in the first instance to cover future groups of new militiamen, but capable of expansion in the light of experience

1 See *Lancet* July 1, 1939, p 49
2 Dormer, B A, and Collender, K G, *Ibid*, 1939, 1, 1309

ANNOTATIONS

INDUSTRIAL HYGIENE

THE report[1] of the Chief Inspector of Factories for 1938 is coloured by two unrelated facts or sets of circumstances, one being the operation of the new Factories Act 1937 and the other the state of international tension and consequent rearmament Mention is made of a greatly increased demand for defence material of all kinds, of great activity in aeroplane construction, of the building of new ordnance factories and munition works, and of the flourishing state of the iron and steel trades It is pleasing to note that the trading estates established in the Special Areas are developing rapidly At Team Valley near Gateshead, for instance, the number of occupied factories has risen from 29 to 86 during the year with an increase of 1160 workers In Renfrewshire and Wales similar improvements are noted The articles manufactured on these estates are not all of war like intention and the varied list contains light metal goods, food stuffs, motor car bodies and safety glass The variety in manufacture replaces to a great extent the employment on heavy industries on which these areas depended so much in the past Sir Duncan Wilson, the chief inspector, points out that, in welcome contrast to the previous two years, there has been a decrease in the number of reportable accidents, amounting to 7 per cent for fatalities and to 6 per cent for all accidents whereas in the manufacturing industries alone the decreases were 12 5 and 10 per cent respectively In the metal rolling mills the number of accidents fell by as much as 30 per cent, those occurring on power presses by 25 per cent and those due to transmission machinery by 17 per cent, on the other hand the number of accidents on building operations has risen by 20 per cent In spite of the reduction in general accident rates which Sir Duncan suggests might have resulted from the safety requirements of the new act, there is still room for further improvement

The new act has reduced the permissible working hours of women and young persons to 48 per week with a limit of 6 hours overtime in a week and 100 hours in a year—overtime being prohibited for all workers under 16 years of age Previously it had been possible to work a woman or young person 12 hours a week and 600 hours a year beyond the 48 hour week The application of the hours of employment provisions of the act has caused a good deal of confusion in different industries but some firms have been surprised and at the same time gratified to find that with *shorter hours* their production has been as good and their expenses have been lower It is remarkable that employers and employees still have not learned the lesson that long hours of work in many processes *bring* about an actual reduction of output, a point which the Industrial Health Research Board has made year after year in its annual report

Under the new act the certifying surgeon becomes examining surgeon, with increase of duties, responsibilities and fees, and the changes seem to be resulting in an increased sense of responsibility and pride in the importance of the work The innovation of medical record cards to be filled in by the examining surgeons after their examination of young persons has added to the interest of the work and these records, when collated and analysed, will provide the much needed information on the general health of young persons in industry

PRESCRIPTIONS FOR SULPHANILAMIDE

SINCE the Pharmacy and Poisons Act, 1933, came into operation sulphanilamide, under whatever name it is offered for sale by manufacturers, has been added to schedule 4 of the Act This schedule contains the names of substances which may be supplied to the public only on a medicine prescription The addition was recorded in our columns when the notice to this effect was gazetted, but some prescribers occasionally overlook the fact that the prescribing of sulphanilamide is subject to the same legislation as barbiturates Consequently they are apt not to define precisely the number of times the prescriptions may be dispensed It is usual in prescribing barbiturates for the prescriber to indicate the total quantity the patient is to receive, but prescriptions for sulphanilamides often bear the simple instruction "To be repeated" While such an instruction is permissible under the regulations, there is the danger that the patient may use the prescription to obtain supplies in excess of those intended by the prescriber The chemist who dispenses the prescription marked thus is not required to retain it, and it may therefore be taken from one chemist to another If prescribers would indicate the number of times such prescriptions are to be repeated, dispensers would be relieved of a justifiable anxiety when presented with a much thumbed prescription for a schedule four substance

LEPTOSPIROSIS

WEIL'S disease has lately been much in the professional if not in the public eye, for it was discussed at Amsterdam last year and at Aberdeen last month, as reported in this issue, and is the subject of a bulletin of the Health Organisation of the League of Nations[1] The disease has also assumed legal importance and has been the basis of a number of actions under the *Workmen's Compensation Act* Many industrial concerns are now alive to its risks, and the present publicity must lead to more effective steps being taken to minimise them The infection is essentially an occupational one and takes different forms in different occupations The "swamp fever" of Russia and Germany chiefly affects land workers after floods The reservoir of the organism *Leptospira grippo typhosa*, is unknown, but field mice are

1 Cmd 6081 H M Stationary Office Pp 133 2s.

1 *Bull Hlth Org L.o.N.*, 1939, 8, 144

suspected The symptoms are gastro-intestinal, jaundice is absent and the mortality is nil. The type due to *L. canicola* has chiefly been reported in the Netherlands, though recently the serum of a Glasgow tripe-dresser agglutinated this strain. The only known reservoir of this type is the dog The most important type in this country is that due to *L. ictero-hæmorrhagiæ*, the chief carrier of which is the rat In some localities more than a third of the rats are "healthy" carriers excreting the organism in their urine Human infection is acquired through the alimentary tract or by contact from contaminated water or other material It was common on all fronts during the war, and during the last few years it has been found among the fish-workers in Aberdeen, sewer-workers in London and Glasgow, tripe-dressers in Glasgow, coal-miners, and workers in the beet-fields in Ireland, who are probably infected through abrasions of the hands in the same way as are the sugar-cane cutters in Queensland The classical description of Weil's disease gives a false impression of its course, for some 60 per cent. of cases show no jaundice at all Many are mis-diagnosed as influenza, and if a patient presents an acute fever of obscure origin with muscular tenderness, conjunctival injection and a neutrophil leucocytosis, the possibility of Weil's disease should be investigated by bacteriological and serological tests, particularly when there has been any risk of infection Where there is a definite occupational hazard it may be wise to administer antileptospiral serum while awaiting laboratory confirmation.

AGE AND PARITY IN PLACENTA PRÆVIA

FROM an analysis of sixty-nine carefully acquired maternal histories, in which there were seventy-two cases of placenta prævia, Penrose concludes that maternal age and multiparity are both likely to be important factors in the production of this condition [1] If these seventy-two cases had been randomly distributed amongst all the pregnancies which these women had experienced, then the average age at which placenta prævia occurred would have been 29 10 years. The observed average age was in fact 31·86 years, a difference beyond what is likely to be due to chance. Mothers of 35 years of age or more produced twenty-seven out of the seventy-two cases, whereas they would have been expected to produce only fifteen if age had no effect The same form of comparison shows a clear tendency for mothers with a high degree of multiparity to be over-represented in the series; the observed mean birth rank was 3 55 and the expected mean only 2 58 Similarly there were twenty-three observed occurrences of placenta prævia at birth orders of four or more against an expectation of only fourteen Age and parity are, of course, themselves associated, and the number of observations available to Penrose is rather small for the determination of the relative importance of each independent of the other. Using the method of correlation, he finds, however, that multiparity probably has an independent effect though this may be less important than that of maternal age Further subdivision of the observations shows that the mean maternal age for central placenta prævia was significantly high while for marginal and lateral cases it was not abnormal. This observation is confirmed by a further series of cases collected from the Royal Free Hospital. On the other hand the mean number of pregnancies was almost exactly the same in both central and non-central groups Finally, the data gave no evidence that the length of time elapsing between the abnormal pregnancy and the pregnancy immediately preceding it was unduly short in comparison with other pregnancy intervals in the families studied. There was also no obvious tendency for the condition to affect the firstborn. Incidental observations show that the mother survived in sixty-seven of the seventy-two cases but the child in only twenty-five instances. Judging from these hospital cases cæsarean section appears to be the most satisfactory form of treatment from the point of view of the child, and scarcely less favourable than version and extraction from the point of view of the mother.

1 Penrose, L S, *J. Obst. Gynec.*, August, 1939, p 615

ALCOHOL IN AIR FORCES

THE anxiety expressed in other countries about the prevalence of alcoholism among air-pilots may have led to doubts about the state of affairs in this country. During the war of 1914–18 heavy drinking became almost a convention among flying men, and this convention lingered afterwards It had arisen at a time when the inferiority of our machines compared with those of the enemy was felt to justify an infusion of Dutch courage, but now that its underlying cause has been removed it exists no longer For junior officers of the Royal Air Force, wine bills are strictly limited; there are non-treating orders in messes, bars are not open for alcoholic drinks in flying training schools until the evening, and drinks may not be consumed in private rooms To break the first two of these rules is a court-martial offence In the past few years, too, the mental attitude of officers towards drink has changed The Service has become a career and permanent commissions are hard to get. Promotion has depended upon examinations, specialisation, linguistic skill and staff-college work, as well as ability at flying and games. Heavy drinking cannot and does not mix with these, and the routine medical examinations serve as a continual check which reveals any incipient physical or emotional disability

THE TRELOAR MARINE HOSPITAL

Sir Alexander Maclean's noble gift will make it possible to provide the cripples' hospital at Alton with a complete seaside annexe at Sandy Point, Hayling, where 120 children will continue their recovery from poliomyelitis under ideal conditions. Pioneer work has already been done there with the wattle hurdle and the glowing brazier on the sea-beach, but these were insufficient to deal with last year's epidemic of poliomyelitis, when Sir Henry Gauvain was fortunate in getting many of the cases at a stage when orthopædic treatment is most beneficial After an initial period of entire rest, the patient, still paralysed and immobilised in splints, is transferred to the pool where the splints are removed when the limbs are supported by water. There being no friction, exercise is practically effortless It was the American experience with such pool treatment that determined the donation; there, skilled technicians enter the pools with the patients and carry out the prescribed movements. In the new pool at Sandy Point the buoyancy of the sea-water may produce results which have not been possible as yet elsewhere The sea-water pool, 30 ft. by 15 ft with water at a temperature of 92° F., will have under-water illumination to assist the exactitude of the treatment A super-saline pool will be used for cases of osteomyelitis with discharging sinuses A current pool will provide water massage for scoliosis and polio cases A super-warm pool, with a temperature not less than 100° F., will offer sedative treatment for spastic paraplegia, and air bubbles can be utilised in a modified Hubbard pool.

Acute polio cases will now be admitted direct to Sandy Point hospital and treated in an isolation pavilion which will have a room for cases of respiratory failure, where there is also swallowing difficulty the patient can be placed prone with lowered head and an electrical sucker to remove mucus from the glottis The big pool room will have folding doors which can be thrown open towards the sea, patients will be transferred from the wards by trolleys and lowered by hydraulic cranes on to floating plinths After removal from the water they will be dried by a combination of hot air and towel friction and then have treatment by light, radiant heat or massage Education will be available for all those undergoing long treatment

LIGHTENING OUR DARKNESS

THE demands of A R P have created a new use for complementary colours A red light is completely invisible when looked at through blue glass For complete suppression of the light, it is essential that the tinting should be very precise A practical cellulose acetate derivative called Rhodoid has been developed by May and Baker Ltd It should prove of great value for darkening windows of hospitals and other buildings where curtains would be neither practicable or desirable Samples of rhodoid have been tested at the Government's building research station at Watford, and at the Bradford Royal Infirmary Here the A R P committee fitted one room with lamps covered with pink tinted rhodoid shades A similar tinted pale blue covering to the windows made the pale red light from the lamps completely invisible from outside The material is fixed permanently to the inside of the windows by means of an easily applied adhesive When there is no danger from an air raid, windows can be left open in the usual way and so admit ordinary daylight which practically eliminates the blue tint At night, with all the lights on and no opaque covering across the windows, not a glimmer can be seen from outside The windows are quite black as though boarded in By day or night, if warning of an air raid is received, all that is necessary in any building equipped in this way is to close the windows and fasten the pink lampshades Activities can continue inside uninterrupted The system should be of particular value for operating theatres where by means of special wiring arrangements illumination can be instantly switched from white to pink as soon as a warning is heard We understand that a similar system is in operation in parts of St Thomas's Hospital, where tinted bulbs are used

CONVULSIONS IN CHILDHOOD

IN his latest contribution to the study of convulsions Peterman[1] of Milwaukee describes his investigation of 1000 cases Taking the causes in chronological order he finds that birth injury accounts for 15 5 per cent The next hazard is the acute infections, and of Peterman's series respiratory infections and infectious diseases, not including meningitis, encephalitis and gastro enteritis, were responsible for 14 per cent The pathological basis of these convulsions is not clear High fever alone may be responsible, and it is recognised that convulsions associated with fever may recur at irregular intervals for the first two or three years of life, but not after that Between six months and three years the possibility of spasmophilia arises, and 8 9 per cent of Peterman's cases were put down to rickets When this age-period is passed idiopathic epilepsy comes to the fore, and accounted for 23 6 per cent of Peterman's cases Of the remainder, 12 7 per cent are listed as miscellaneous, and 5 3 per cent as "cause not established" Peterman suggests that some of the convulsions included in this last group were due to dural sinus thrombosis following gastro enteritis, but it is surprising that alimentary disturbances occupy such a small place in his series What are termed "terminal convulsions" are not included, and this may cut out the type of case in which gastro enteritis has seemed to play a part He gives no support to the belief that teething, worms and adhesions of the foreskin cause convulsions

In treatment Peterman maintains that hot baths or hot packs do more harm than inactivity As emergency measures he favours cold packs or cool sponges if there is high fever, and a cool hypertonic saline enema, such as a 25–50 per cent solution of magnesium sulphate Next in importance Peterman places the prompt administration of chloroform, which he regards as safer than morphine or opium or even chloral He regards lumbar puncture, if facilities permit, as of great value not only in treatment but also in diagnosis Every convulsion produces serious injury to the brain and the aim of treatment is to stop the convulsion as soon as possible and prevent recurrences A point often overlooked is that after a convulsion a child should be treated as in every cranial injury with absolute rest in bed for several days For recurring convulsions Peterman advocates phenobarbital as the drug of choice, and for idiopathic epilepsy he reiterates his belief in a ketogenic diet Here he enters controversial ground

TRANSFERS DURING DOCTORS' ABSENCE

THE Minister of Health has been asked by the Insurance Acts Committee to arrange for the readmission to the lists of practitioners who are called up for service during peace time under the Reserve and Auxiliary Forces Act, 1939, of insured persons who transfer during their absence The Minister has accordingly issued a regulation that comes into force at once by which, on the return of practitioners from service such insured persons will be re transferred without application or notice on their part On receipt of a request from the returning practitioner the insurance committee will inform the insured persons of the intended re transfer and if they do not object within 14 days the re transfer will be made Copies of the regulation and an explanatory letter have been sent to all insurance practitioners and the attention of those called up under the act is drawn to the importance of notifying the insurance committee concerned without delay of their intended absence (and the reason) and of their deputising arrangements The new regulation will apply only to what are known as end of quarter transfers, transfers because of permanent removal and those with the consent of the practitioner concerned are specifically excluded

THIS WEEK'S ISSUE

Difficulties of publication arising out of the international crisis have made it necessary to rearrange the contents of this week's issue of THE LANCET, *and the Proprietors express to subscribers their regret at the omissions required The journal is being printed at Aylesbury, and urgent communications may be addressed to the Editor at Messrs Hazell, Watson & Viney's printing works there But the London office remains open at 7, Adam Street, W C 2 (Tel Temple Bar 7228–9)*

1 Peterman M G, *J amer med Ass* July 15 1939, p 191

SPECIAL ARTICLES

EMERGENCY NOTICES

ISSUED BY THE CENTRAL EMERGENCY COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION

1. *In time of war the Central and Local Emergency* Committees established by the British Medical Association will be responsible to the Government for the supply of medical personnel for the fighting forces and for the civilian population.

2 The allocation of practitioners for duty at first-aid posts is now complete. The appointment of practitioners to the Civilian Hospital Service, classes A and B, is practically complete, and any member of a hospital staff not liable to call for other duties who is uncertain as to his position and duties in the event of war should immediately communicate with the Group Officer for his area

3 Demands for medical personnel for the Services will, as hitherto, come from the department or service concerned direct to the Central Emergency Committee, which will allocate a quota of the demand to each local emergency committee, having regard to, inter alia, the movements of the civil population Practitioners who have intimated their willingness to undertake national work of one kind or another but who have not yet been allocated should wait until they are approached by their local emergency committees

4. After the outbreak of hostilities any practitioner in an evacuation area who, as a result of evacuation, is rendered unemployed and is willing to undertake work in a reception area should register with the secretary of his local emergency committee and request that his name be added to the reserve list which is being maintained by the Central Emergency Committee at this office

5 After the outbreak of war and the putting into operation of the official evacuation schemes, local emergency committees in reception areas will estimate the additional requirements in their areas for medical personnel of all kinds and will communicate their needs to this office.

6 There are now in the possession of all local emergency committees in England and Wales supplies of the following three documents:

(1) Memorandum of Ministry of Health explaining procedure for medical certification in connexion with payment of injury allowances in time of war.

(2) A book of first certificates to be used by medical practitioners in certifying war injuries.

(3) A copy of a memorandum of advice by the Registrar-General to medical practitioners on the methods of death certification in respect of civilians killed by enemy action.

Local committees have been requested to distribute a set of these documents to every medical practitioner in their areas if and when a state of war is officially announced or on any earlier intimation from this office

7 In reference to the certification by medical practitioners in connexion with the payment of injury allowances in time of war, referred to in 6 (1) and 6 (2), medical practitioners should give the necessary certificates to the appropriate injured persons applying to them without charge, whether those persons are insured persons or not The Association has informed the Government that it will advise the profession to undertake this service in the public interest. Although the great majority of these certificates will be issued by hospital authorities some patients will no doubt apply to their own practitioners for them and every practitioner remaining in private practice should have a book of certificates in his possession Arrangements for further supplies will be the subject of a further announcement.

8 This paragraph applies only to the following areas.

All English counties, except London and Middlesex, and the following county borough councils: Barrow-in-Furness, Bath, Blackpool, Bournemouth, Brighton, Burton-upon-Trent, Canterbury, Carlisle, Chester, Eastbourne, Exeter, Gloucester, Hastings, Ipswich, Lincoln, Northampton, Oxford, Reading, Southport, Worcester and York.

These are areas to which will be moved numbers of pregnant women from evacuation areas Their medical officers of health have been asked now to consult with the local emergency committees on the question of the available obstetric personnel. Local emergency committees are asked, after consultation with the medical officer of health, to make any necessary recommendations for allocation, and, if it is agreed that the number of obstetric consultants available in the area is insufficient, *now* to make the appropriate request to the Central Emergency Committee for additional obstetric personnel.

9. The Association has agreed with the Ministry of Health the terms of the financial arrangement for the medical treatment of children evacuated to reception areas under the Government's scheme In this connexion the following communication has been dispatched to all medical practitioners in reception areas:

"This is an important communication addressed to every *medical practitioner in a reception area*, that is, in an area to which there will be official evacuation of children under the Government evacuation scheme. Agreement has today (Aug 27) been reached between the Association and the Ministry of Health as to the financial arrangements for the medical treatment of children transferred to reception areas under the Government scheme. The arrangement applies to each child who is billeted upon an householder, not accompanied by a parent. It does not apply to children accompanied by parents.

"There will be placed at the disposal of each local emergency committee in a reception area a sum of money to meet the cost of the provision of medical attendance This sum will be calculated at the rate of 10*s* a year for each unaccompanied child transferred under the scheme This money will be disbursed to practitioners undertaking the treatment of children covered by the scheme on a basis devised and approved by the local emergency committee concerned. The amount paid is intended to cover the cost of attendance and the provision of medicines.

"The main purpose of this letter is to inform you of the fact that this financial arrangement has now been approved and that in respect of unaccompanied children transferred under the Government evacuation scheme payment should be sought, not from the patient or the householder, but from the local emergency committee.

"*Local committees have today* been asked immediately to devise their schemes of distribution and to inform the practitioners of their decisions If you are called upon to treat any children covered by this arrangement before the local emergency committee has communicated its scheme to you, please record particulars of such treatment, including the name and address of the patient."

Local emergency committees will realise that local schemes of distribution should be determined at once It is probable that payments will be made at the end of each quarter. The committee may decide to pay on an item of service basis, within the capacity of the pool, it may decide to pay a quarterly capitation per patient seen, whatever the number of items of

service, the capitation fee being calculated by dividing the number of persons treated into the amount available. If it decides to introduce practitioners, through the Central Emergency Committee, to treat *these patients*, their remuneration in respect of this work should be provided from the local pool. In short, the responsibility for providing an adequate service for these unaccompanied children, and for the distribution of the local pool, rests entirely with the local emergency committees in reception areas to which such children are evacuated.

10. The address of the Central Emergency Committee will continue to be this House—unless and until an intimation is given to the contrary.

British Medical Association House,
Tavistock Square, London, W.C.1

MEDICINE AND THE LAW

Surgical Instrument left in Body

AT an inquest at Weston-super-Mare on Aug. 21 the jury found that a woman aged 66 had died of shock following a severe operation for perforation of the bowel due to the presence of a metal depressor in the abdominal cavity. An X-ray photograph had shown the presence of this piece of metal, an operation had been deemed necessary for its removal. There had been a previous operation on June 8 for removal of a cancerous growth. There seemed no doubt that the depressor had been left inside the patient on that occasion. The first operation had taken place in a private hospital in Bristol. A nurse who was in charge of the operating theatre at Bristol was unable to remember whether she herself or another nurse who was also present had counted the surgical instruments before or after the operation. In the jury's view there had been negligence, not amounting to criminal negligence, on the part of those in charge of the operating theatre, inasmuch as there had apparently been no strict supervision of the instruments. The surgeon who had operated on the first occasion was said to be on his way to America. The jury said it did not want the inquest adjourned in order to hear his evidence.

There have been judicial discussions on the question how far the mere presence of a swab, forceps or other instrument in a patient's body after an operation may be said to establish a prima facie case of negligence against those in charge of the operation. The Latin maxim *res ipsa loquitur*—the thing itself speaks—has sometimes been relied upon. On the other hand an eminent Scottish judge has contemptuously remarked that if that maxim had not been in Latin, nothing would have been heard of it.

Injection from the Wrong Bottle

An inquest at Cromer last week indicated the inadvertent use of a bottle of morphine instead of a local anæsthetic. The jury, returning a verdict of accidental death, added a rider that it might be suggested to the drug companies that morphine should be issued in distinctive bottles.

The deceased woman, aged 25, suffered from advanced tuberculosis in both lungs and was unable to do any heavy work. She became pregnant and her medical attendant, after taking a second opinion, arranged for her to go into hospital to avoid complications. Unfortunately the child was born quicker than was anticipated. The doctor, arriving ten minutes after the birth, found the patient's condition reasonably good but deemed it advisable that she should enter the hospital where she received treatment. An injection was administered on the Saturday. On the Monday an operation was decided upon and Novocain was to be injected. The sister who had prepared the tray on the Saturday had then been to the cupboard which contained two bottles and had taken the right one. On the Monday the bottle containing the local anæsthetic was not in its place in the cupboard. The sister took the only bottle from the cupboard. The mistake was not discovered until an injection of morphine had been given by mistake. The two bottles were similar in colour and size. The two solutions could not be distinguished in colour when in the syringe used for the injection. The injection of morphine accelerated hypostatic pneumonia to which death was due. It was announced that the management committee of the hospital would take immediate steps to see that the bottles of morphine would be distinctive in size and colour.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

HUMAN GENETICS

THE seventh international genetic congress opened at Edinburgh on Aug. 23. About 500 delegates were present representing 33 countries. Before the formal opening, the delegates spent two days in London and two in Cambridge, where visits and demonstrations had been arranged for them. A special tour then enabled many foreign members to visit, on their way to Edinburgh, such places as Stratford on Avon, Chester, and the Lake district. At a plenary session held in the McEwan Hall, Edinburgh, the congress was welcomed by representatives of the City and the University, and Dr. F. A. E. Crew, Buchanan professor of animal genetics at Edinburgh, was elected president. The vast scope of the congress is shown by the fact that the section of human genetics was one of nine, and the programme of this section alone included nearly sixty papers. The international high tension led to some modifications, and many were the anxieties of those organising the congress. In its somewhat mutilated form the congress was a good one even by absolute standards.

DIPHTHERIA IMMUNISATION IN GLASGOW

The health and education committees of Glasgow town council are drawing up a scheme for the immunisation of school children against diphtheria. The scheme will be voluntary, requiring the signed consent of parents, and its working will be undertaken by the public health and school medical staffs with the assistance of health visitors. A notice will be placed in each child welfare and school clinic giving details of the scheme, and information regarding the incidence of diphtheria and the value of immunisation will also be distributed to parents. The medical officer of health proposes that each child should be given two inoculations with a fortnight's interval between and inoculation will be carried out at the corporation clinics *in various parts of the city*.

REFUGEE WOMEN AS MIDWIVES

On the request of the midwives department of the Coördination Committee for Refugees the Greenock corporation has decided to allow six women refugees from Germany, Czecho-Slovakia or Austria to become pupil midwives at the Rankin Hospital. The convener of the public-health committee admitted that there was difficulty in obtaining the services of midwives at present, but he thought there were enough suitable women in this country without calling on foreign refugees. The medical officer of health said, however,

that the services of these women are urgently required, and indeed that the Rankin Hospital may have to close down unless something is done to relieve the situation. After the present batch of pupil midwives have completed training there are no more to come forward. In agreeing to give this permission to the refugee women the corporation decided to ask for a guarantee that they would not remain in the district and compete with nurses in Greenock after completing their training.

CAMPAIGN AGAINST RHEUMATISM

A resolution urging the Government to set up clinics for the treatment of rheumatic diseases throughout the country has been adopted by the insurance committee for the county of Lanarkshire and it is to be sent to the annual conference of the Scottish Association of Insurance Committees at St Andrews in September Lanarkshire is said to be suffering severely from a lack of provision for such treatment and even in Glasgow the facilities seem to be insufficient. Lanarkshire has the highest sickness-rate in Scotland, and the committee urges that one of the most effective ways of remedying this state of affairs would be the development of more efficient treatment both for those who are already incapacitated by rheumatism and for those in whom the disease can still be checked in the early stages.

PARIS

(FROM AN OCCASIONAL CORRESPONDENT)

THE NEW CARNET DE SANTE

Monsieur Marc Rucart, the French Minister of Public Health, has recently sponsored the issue of a health passport of which great things are expected Hitherto, sporadic attempts to put systematically on paper the most important medical features of Frenchmen have been successful enough within their limited spheres and have pointed the way to a more comprehensive scheme on national lines Every French baby is now entitled to receive at birth, free of charge, a health passport in which are to be entered all the important medical events in his or her life as they occur, from vaccinations and inoculations to the operations of the dentist In a sense, this passport is to take the place of the more or less defunct family doctor As the patient enters the consulting-room of a specialist for the first time, it will not be a letter from the family doctor but this passport, presumably kept well up to date, which will provide those clues with which even the most perspicacious specialists cannot always dispense The identity of the owner of the passport is not betrayed on it by his name, being indicated only by a number This should be of use if the passport is lost Further, it provides for the preservation of professional secrecy. The passport should prove useful to the Army Medical Service, but inquisitorial employers in civil life are not entitled to see it. The first part of the passport will record information about heredity, operations, vaccinations, accidents, rate of growth and so on. In short, it will be the medical history of the holder and his or her parents The second part is intended to serve as a dental-history record The card is not compulsory, but parents and guardians are urged to endow every child with it, and to ensure that the necessary records are entered in it as promptly as possible. The reception given to this health passport by the French press has, on the whole, been favourable.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE LUNACY LAWS

A MOVEMENT for radical reform in the laws relating to lunacy has shown itself among the administrative authorities of the public mental hospitals in Ireland. The committee of the Grangegorman (Dublin) Mental Hospital—the largest and most important in Ireland—following the lead of the committee of the Sligo Mental Hospital, last week adopted a series of resolutions to be submitted to the Government, recommending several far-reaching reforms, and asking for the appointment of a commission of experts to study the matter

Among the reforms recommended is an alteration in the laws governing the admission of patients to the public mental hospitals. It is suggested that the present laws practically necessitate that prospective patients should be regarded either as criminals or as paupers in order to secure admission. The result is that relatives are deterred from putting patients under treatment until the disease is far advanced. To remedy this defect the reception and treatment of voluntary patients in the public hospitals should be legalised. At present voluntary patients can only be received in private institutions The committee also suggest the establishment of separate institutions for separate classes, for example, mental defectives, epileptics, recent cases of insanity and chronic cases. That the time is ripe for such reforms is beyond doubt, and it is a healthy sign that the committee of the mental hospitals recognise the fact.

SWEDEN

(FROM AN OCCASIONAL CORRESPONDENT)

POLIOMYELITIS IN TOWN AND COUNTRY

A FEW weeks ago Dr. Jönsson published a thesis on poliomyelitis, in which he deduced that the disease is just as frequent in urban as in rural communities Dr. Jönsson has started a controversy whose temperature has reached almost theological heights. Prof. C. A Kling, of Stockholm, has pointed out that the evidence in support of poliomyelitis as an eminently rural disease is wellnigh overwhelming In his study of the epidemic in Sweden in 1905, Wickman found that only about 12 per cent of all the cases occurred in towns. Leegaard came to approximately the same conclusion for Norway between 1904 and 1912 Studying the great Swedish epidemic of 1912–1913, Wernstedt found that the more urban the population, the lower was its morbidity. Prof. Kling himself has come to the same result from his studies of poliomyelitis in Rumania in 1927. A study of conditions in Finland, which Prof. Kling has not yet published, has yielded similar findings What the orthodox would consider as the Jönsson heresy deals with the behaviour of poliomyelitis in Sweden between 1921 and 1937, and it is suggested that he has gone astray in attaching too much importance to non-paralytic cases of the disease, in many of which the diagnosis may have been mistaken. Prof Kling, who is in charge of the state bacteriological laboratory in Stockholm, hopes soon to be in a position to issue a report on a prodigious work undertaken by his staff about the behaviour of poliomyelitis in Sweden between 1933 and 1938. To establish a comprehen-

ive epidemiological survey, some 8000 records have been sifted In attempting to extract valuable information from this enormous and amorphous mass of documentation, Prof Kling must be haunted by the dread of every thoughtful artist—shall I, in painting in all these trees, end by hiding the wood?

INDUSTRIAL DISEASES

In the course of only two or three generations the familiar agricultural timber growing Sweden has become industrialised to a remarkable degree A sign of the times is to be found in the Lennander lecture delivered this year by Dr Gerhard Rundberg, who chose modern industrial diseases as his subject Since 1929, one law after another has been passed in an attempt to protect the worker from the risks of his employment, and even now the legislative net has not succeeded in catching all the industrial fish Certain infectious conditions are now included within the ambit of industrial diseases, and the statistical returns for the year 1938 include sixty five cases of scarlet fever, and one case each of diphtheria, infantile paralysis and undulant fever, these qualified the sufferers for compensation under the new law The predominance of scarlet fever over various other infectious diseases is to be explained by the fact that it has recently run riot in Sweden Lead still claims some twenty five victims every year in spite of all precautions During the 7 years silicosis has been included among the industrial diseases qualifying for compensation it has claimed 143 victims, an average of little more than twenty cases a year There is approximately the same yearly average from poisoning with benzene and allied chemicals

To illustrate the suddenness with which new industrial diseases may arise, Dr Rundberg gave an account of a Swedish metallurgical firm which, at the end of 1938, received a small order from Germany for an iron compound of vanadium The order being small, and the work on it being considered as provisional, little was spent on precautions against poisoning But after only a day's work in contact with vanadic acid, several of the workmen developed severe bronchitis with profuse yellowish green expectoration, as well as general lassitude and irritation of the skin of the face and hands Naturally enough, the men refused to continue their work In cases such as this, it is fortunate that the good times at present prevalent in the industrial world encourage employers to incur expenses in the protection of their workmen against industrial risks

LETTERS TO THE EDITOR

HEREDITY OR ENVIRONMENT?

SIR,—Your leading article of two weeks ago headed Neurosis or Psychosis? contains the sentence "This school finds that in the causation of the neuroses and psychoses both heredity and environment play their part, . . " The common fallacy that heredity and environment can be treated as separate entities thus appears, no doubt unintentionally, to receive editorial sanction Luxenburger[1] has shown that binovular twins have only a small liability to concordant schizophrenia, but that the likelihood of monovular pairs agreeing is great With certain reservations and assumptions, we can deduce from his figures that the environment of the developing fœtus in the uterus is not an important factor, that the environment of postnatal life is also of little importance unless a particular hereditary constitution is present, and that the postnatal environment is of very great importance when this susceptible type of constitution is present Schizophrenia is therefore like the other common diseases It is meaningless except under special circumstances as Hogben[2] has pointed out, to discuss whether heredity or environment is the more important, because the answer depends on our personal philosophical outlook Given a good or perfect environment, heredity is unimportant From the opposite point of view, in a world where good and bad environments are the rule heredity does in fact determine the incidence of schizophrenia, as well as most other non infectious diseases

Might I follow this chain of thought further and give some other examples of the interaction of heredity and environment? If a suboptimal amount of vitamin C is present in the diet of guineapigs, some animals will develop scurvy and others won't By selective breeding it is theoretically possible to isolate strains with varying resistance to C deficiency Under these conditions, an intelligent, medically minded guineapig knowing nothing of other types of diet, might be excused for thinking that scurvy was a hereditary disease and that his human masters were justified in following a eugenic policy to eradicate it Another example can be taken from stock farming Our cattle are doing well, but we decide to try a new regime Some of the animals do well on it, some badly We are faced with two alternatives Either we breed from the animals who do well and attempt to establish a race which suits the new conditions Or we decide to go back to the old regime and not venture on a course of selective breeding the consequences of which might in the long run be disastrous

Parallels to the attitude of mind of our medical guineapig are easy to find in the history of human medicine The connexion between environment and disease is only obvious when two populations living under different conditions are studied together When the environment is more or less standardised, heredity or diathesis must inevitably appear as the factor responsible for disease, even as recently as the last two decades, the ideas of the scorbutic diathesis and rickety diathesis have been revived in out of the way communities In the past fifty years a revolution in our habits of life has occurred Some of the changes seem inevitable and irreversible Other changes, especially dietetic ones, are more under our control It is unfortunate that at this biologically interesting juncture in the history of the human race prevailing medical fashion is going back to the dark ages and again ascribing ill health to diathesis and heredity The history of medicine shows that these conceptions, however true are sterile They have done little or nothing for the prevention and treatment of disease and it is easy to find examples of how they have actively retarded progress Today ideas such as the hyperchlorhydric diathesis or the highly strung temperament relegate to the background the study of the effects of diet It would be ludicrous, if the results were not so sad, that in all the experimental dietetic work which has been carried out, there have been no parallel X ray and endoscopical observations on the intestines

1 Luxenburger H *Z indukt Abstamm u Vererb Lehre* 1932, 61, 323
2 Hogben L Nature and Nurture 1933

I conclude by re-emphasising that biological theory and twin research (as carried out on the totalitarian scale in Germany) show the universality of this interaction between heredity and environment in disease. And further that medical history warns us that the constitutional factor in disease is difficult to understand and still harder to treat The environmental factor, on the other hand, may be surprisingly easy to control when it is simplified to essentials.

I am, Sir, yours faithfully,

Oxford, Aug 19 DENYS JENNINGS.

NEUROSIS OR PSYCHOSIS?

SIR,—Your leading article under this heading stimulates comment of many kinds, but I shall confine myself at present to pointing out the practical implication of the "quantitative" view of the difference between "neuroses" and psychoses It is simply this, that since neuroses are but mild psychoses (sic) and since psychotherapy is of little use in the latter, so it is of minor importance also in the former. It would be a great pity if the influence of this doubtful (and I think, unscientific) view were to discourage the use of the more recondite forms of psychological treatment by those medical men who have both the aptitude and the necessary type of training.

This is all the more important since it was recently evident at the Mental Hygiene Conference, convened by the National Council for Mental Hygiene, that lay people feel not only that there is a need for this kind of treatment but that the medical profession is failing to supply it It was I believe largely with this factor in mind, and with a consciousness of the justice of the criticism, that a committee of the B.M A. recently recommended the recognition of lay psychotherapists This dubious experiment may yet be forced upon us While there is yet time, it is essential that those who can influence medical opinion with regard to the nature of neurotic illness should be willing to admit what is well established—that there is a technique of psychotherapy of a sort which does require special gifts, special experience and (except in a few with a special share of the divine afflatus) a prolonged course of training This needs stressing if we are not to lose the ground which has been won, often by members of the profession whose work has been grudged recognition by its own high priests We are told that "there is nothing in psychotherapy that any doctor with the right personal qualities and a few fundamental principles to guide him cannot learn for himself" Substitute "surgery" for "psychotherapy" and the quality of this corollary of the quantitative theory becomes evident

I am, Sir, yours faithfully,

R. D GILLESPIE

Chester Terrace, N W 1, Aug 22

"DORMANT" LEAD POISONING

SIR,—I should like whole-heartedly to support the remarks contained in the annotation in your issue of Aug 19 under this heading It is indeed time that some of the myths associated with lead poisoning were cleared up In the past there has been a tendency to accept these cases far too uncritically, and in more recent years the "mobilisation of dormant lead" is frequently called in to explain symptoms without sufficient evidence. It is obvious that anæmia colic and constipation are common symptoms, and in most cases there is no history of previous lead absorption If, however, such a history is forthcoming, there is a dangerous tendency to attribute the symptoms to the lead exposure, irrespective of when it occurred or of what degree it reached. It would be interesting to know on what grounds Dr. Gordon Ward, during the war years, ascribed the symptoms in his cases to lead that had been absorbed many years previously.

Over fifteen years ago Aub and his collaborators showed that lead could be mobilised from the bones; and, in fact, most clinicians with a reasonably wide experience of these cases will have at some time precipitated symptoms in a recent case of plumbism by too vigorous "de-leading." But this is a totally different question from the mobilisation of lead after a period of years As you point out in your annotation, lead soon passes from the trabeculæ, where it is comparatively easily influenced; and having done so, I know of no reliable evidence, either clinical or biochemical, to suggest that it can again easily be brought into the circulation in sufficient quantity to produce severe symptoms. This experience is, I know, similar to that of two leading American industrial physicians who have special opportunities of meeting these cases

May I enter a plea for a more critical attitude in these cases? It is easy and tempting to accept a seemingly plausible explanation for a puzzling case, but this is one which I feel must be resisted in the absence of adequate proof.

I am, Sir, yours faithfully,

RONALD E LANE.

Salford Royal Hospital, Salford, Aug 20

FIRST-AID FOR EYE INJURIES

SIR,—I was interested in your report on Aug. 19 of the discussion on ophthalmic services to the civilian population in national emergency, which formed a part of the programme of the British Medical Association's section of ophthalmology, recently held in Aberdeen

It seems from this report that opinions were equally divided for and against the use of cocaine—in favour of it as a local anæsthetic affording relief to persons whose eyes are injured by mustard gas and against it because of its damaging effect on the corneal epithelium I was not present at the meeting and so I do not know if the advantages of Pantocain as a local anæsthetic were mentioned Some years ago I abandoned the use of cocaine in all ophthalmic work and have since preferred pantocain in ½ or 1 per cent solutions It has no deleterious effect on the corneal epithelium, the regeneration of which is not retarded or interfered with in cases of abrasion and ulceration, the pupil is not dilated, the intra-ocular pressure is not raised and there are no general toxic effects from the use of this drug as a surface anæsthetic For 40 seconds after instillation a burning sensation is felt and a transitory blepharospasm is evident The hyperæmia of the conjunctiva induced by pantocain is abolished by a drop of adrenaline if surgical intervention is necessary

It seems to me that pantocain would be of considerable service in the first-aid treatment of gas casualties in relieving pain and thereby calming those afflicted, and that it could be used without danger by lay persons in first-aid posts and mobile units Those injured by mustard-gas vapour would thus be made relatively comfortable and be able to open their eyes, within their gas respirators, sufficiently to walk to a hospital or ambulance-transport post.

I am, Sir, yours faithfully,

Harley Street, W 1, Aug. 23. H. B. STALLARD.

MEDICAL STUDENTS IN WAR-TIME

SIR,—As a medical student, may I be allowed to comment on one important omission from the otherwise careful arrangements for our allocations to various hospitals for war services? It is this—that it seems to have been forgotten that in asking students to carry out such duties they are being placed in the unhappy position of appearing invidiously unique, for in the event of war what other fellows of our age will be about in England? If we exclude conscientious objectors, then it may be said that nearly all our contemporaries in all their various employments will have joined up, and we shall surely be pretty well the only ones not in the fighting services

We have been told and know now that it is our duty to remain behind, to get qualified and then to serve our country, in the services or at home, making use of our professional abilities Thus, it is not for us to follow the many medical students of 1914, who eagerly joined the fighting forces, and who, by their tragic loss, caused the shortage of medical men in subsequent years of the war

But the layman does not appreciate all this, and it is shameful that we should be thought "lucky to be out of it" This implication of "justifiable avoidance" of more dangerous belligerent duties abroad, with the risk of verbal 'white feathers" being thrown at us, is, to say the least, distasteful

I suggest that some insignia, equivalent to the T.A and A R P badges, which could be well understood should be arranged for us Many explanations would then be unnecessary, and none would doubt our honour

I am, Sir, yours faithfully,

L D DE LAUNAY,
Sgt No 7 Coy Medical Unit U L O T C, O G R
The Medical School King's College Hospital,
S F 5 Aug 26

PHYSICAL METHODS IN RHEUMATIC DISEASE

SIR,—It is to be regretted that Dr. H J Taylor's letter in your issue of Aug 19 in no way answers my letter in your issue of the 12th May I again emphasise that a physicist of repute, Dr Judd Lewis, has clearly demonstrated the marked difference in the spectrograms of the titanium alloy arc and the tungsten arc It is known that the addition of iron or tungsten to the core of a carbon makes a vast difference to the output of ultraviolet irradiation Similarly the addition of a small quantity of titanium to tungsten makes a very considerable difference to the output of the total radiant energy—including ultraviolet—from the arc

Surely it is unscientific and wrong to condemn the titanium alloy arc and also low intensity treatment when clinical tests have not been carried out

I am, Sir, yours faithfully,

W ANNANDALE TROUP

Wimpole Street, W 1 Aug 19

PUBLIC-SCHOOL AND SECONDARY-SCHOOL BOYS

SIR,—I read with great interest Dr Bathurst Norman's valuable article in your issue of Aug 19 May I, however, as a matter of record be permitted to recall the fact that the relation of stem length (sitting height) to body weight, the method of measuring stem length and the precautions necessary to avoid errors into which some observers had fallen, for which he quotes Dreyer and Hanson (1920) were put forward by me in a communication on the growth of the body in man, published in the *Proceedings of the Royal Society* (1915, 89, 157) The reference to my paper was given by Dreyer and Hanson in their preliminary article (*Lancet*, 1919, 2, 227), but, by an unlucky oversight, it was not repeated among the references given in their book "The Assessment of Physical Fitness," and it therefore tends to be overlooked Dreyer and Hanson's important studies supported my conclusion that the normal weight of the body is related to the stem length But the much more extensive data, which they were able to collect, with the aid of the Medical Research Council, led them to make some small numerical change in my formula Had my lamented friend, the late Prof Georges Dreyer, been alive, he would have been the first to acknowledge the assistance he obtained from my earlier inquiry

I have recently entrusted the individual data and the calculations concerned therewith to Dr E P Poulton, of Guy's Hospital, since application made by him to the Royal Society has disclosed the fact that my original manuscript and some valuable tables, which latter were not printed for reasons of economy, are no longer in their possession

I am, Sir, yours faithfully,

E W AINLEY WALKER.

University College, Oxford, Aug 28

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUG 19, 1939

Notifications.—The following cases of infectious disease were notified during the week Smallpox, 0, scarlet fever, 1200, diphtheria, 742, enteric fever, 48 (53 "expected"); pneumonia (primary or influenzal), 350, puerperal pyrexia, 175, cerebro-spinal fever, 17, poliomyelitis, 25, polio-encephalitis, 3, encephalitis lethargica, 1, dysentery, 39, ophthalmia neonatorum, 100 No case of cholera, plague, or typhus fever was notified during the week

The number of cases in the Infectious Hospitals of the London County Council on Aug 26 was 2303 which included Scarlet fever 503 diphtheria, 480 (carriers, 13), measles, 18 whooping-cough 552, puerperal fever, 21 mothers (plus 10 babies) encephalitis lethargica, 304, poliomyelitis 21 At St Margaret's Hospital there were 18 babies (plus 10 mothers) with ophthalmia neonatorum

Deaths.—In 120 great towns, including London, there was no death from smallpox, 4 (0) from enteric fever, 2 (0) from measles, 1 (0) from scarlet fever, 8 (2) from whooping-cough, 14 (1) from diphtheria, 43 (11) from diarrhœa and enteritis under two years and 10 (1) from influenza The figures in parentheses are those for London itself

Hornsey Southampton Stoke-on Trent and Cardiff each reported a death from typhoid Fatal cases of diphtheria were scattered over ten great towns Sunderland reporting 3 Chester and Liverpool each 2 Hull and Birmingham each had 3 deaths from diarrhœa.

The number of stillbirths notified during the week was 215 (corresponding to a rate of 37 per 1000 total births) including 45 in London

POSTGRADUATE COURSE IN VENEREAL DISEASES.—A course of instruction in modern methods in the diagnosis and treatment of venereal diseases will be given by Lieut-Colonel L S Burks during October, November and December at the London County Council (Whitechapel) Clinic Turner Street, E 1 Lectures will be given on Mondays and Thursdays at 2.30 P.M., beginning on Oct 2, and on Wednesdays at 2 P.M there will be case demonstrations Further information was given in the advertisement columns of our last issue

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

BY MEDICUS, M P.

THE House of Commons has held two special sessions to deal with the danger of war between Germany and Poland—a danger which would automatically involve Great Britain and France because of our treaties with Poland if war broke out. The week between the meetings has been one of what amounts to a general mobilisation of the armed forces and of the civil defence forces. The news of the Soviet-German pact burst like a bombshell on the country and on the world, but left the nerves of the House and of the country undisturbed. This even tension of nerves marked both the meeting of the House of Commons last week and the meeting this week. Last week, with no serious criticism, the bill to give the Government power to make any regulations necessary for the Defence of the Realm passed both Houses of Parliament in one day. This week *the Prime Minister's statement on the situation* was received with purely formal criticism by the leaders of the Labour and Liberal oppositions But the leader of Labour urged the Government to set about the evacuation of children and the priority classes from the towns while there was yet a lull

The Prime Minister's speech of last week—on Aug 24—has already become a historic document It was debated by some of the first-class brains in the House, but not all the speeches were first class either in matter or in presentation and the debate towards the end was rather ragged. The significance of the debate was in the division list—427 members of all parties voted to give the Government emergency powers and 4 members voted against it. This balance of members very fairly expresses the feeling of the House and of the country to be finished with the business. This time there must be no compromises, no more Munich settlements Mothers with sore hearts waiting outside schools while their children are instructed in evacuation methods say it Workmen building homes or in their workshops say it . . Men at their desks . . Doctors and nurses in hospitals . .

Let us trust that the resolution of the Government will be equally firm. The gage of battle now is no *Czecho-Slovakia but the honour and physical security* of Great Britain and all it stands for of fair-minded freedom in life, in thought and in work So felt the House of Commons on Tuesday, Aug. 29, 1939 The House is to reassemble in a week's time unless emergency before that calls it together again.

MEMORANDA ON CASUALTY TREATMENT

THE Director-General of Emergency Medical Services has prepared a series of memoranda for the information of medical officers of health, group officers and others responsible for civilian casualty organisation One memo gives some general and more detailed advice on early treatment at first-aid posts The first-aid worker is warned against attempting more than his training has fitted him for, and is urged to cultivate common sense rather than overconfidence. The technique recommended generally follows that of the manuals

Another memo deals with the provision of tetanus and gas-gangrene antitoxin. The former is being stored in fifty centres so that it will be immediately available when required Some authorities have advocated a prophylactic dose much larger than that used so successfully in the last war; the dose advised here is 2 c.cm. of the liquid serum provided, which will represent about 2600 international units The serum will be supplied in multiple-dose bottles holding 30 or 60 c.cm, which can be used for a week after the bottle has been opened. For treatment tetanus antitoxin will be supplied in sealed ampoules each containing a single dose of 24,000 international units in some 8 c.cm The arrangements made for the supply of gas-gangrene antitoxin allow for the administration of welch, vibrion-septique or œdematiens antitoxins either separately or combined. Little is known about the dosage of these sera, and that recommended may have to be modified in the light of experience. For prophylaxis the provisional dose advised is 3000 units of welch, 1500 of vibrion septique and 1000 of œdematiens For treatment a combined injection containing 7500 units of welch, 3750 of vibrion septique and 2500 of œdematiens is recommended, and separate antitoxins will be available for intensive therapy where the causal organism has been identified Supplies of these sera will be kept in London, Newcastle, Leeds, Manchester and/or Liverpool, Nottingham, Birmingham, Cambridge, Oxford, Bristol and Cardiff.

It is proposed to provide special centres where certain types of disability can be collected and treated by a specialist staff In the early stages of a war, however, while the switch-over from the central organisation of peace-time to a decentralised organisation is taking place, systematic sorting of cases is likely to be impracticable No attempt will therefore be made to segregate cases in special institutions during the first few days, in this period advance base hospitals will have to be prepared to treat any type of injury. The need for segregation in a special institution is perhaps most urgent in those suffering from neuroses uncomplicated by injury and an effort will be made to provide special treatment from the outset for such patients who are not fit to go home. As regards first-aid, in simply frightened and emotional cases reassurance combined with an appeal to personal and patriotic pride and a large dose of bromide is expected to be sufficient. When confusion, excitement, loss of memory or disorientation are the chief symptoms, rest and warmth, hot drinks with plenty of sugar, and either bromide or phenobarbital or, where there is much restlessness, an injection of morphia or sodium phenobarbitone and hyoscine are advised. When hysterical symptoms predominate medical officers of first-aid posts are urged to attempt to remove them at once by suggestion The main aim in all but the most severe neurotic cases will, however, be to send the patient home as soon as possible.

". . It has come to be my feeling that many of the wound infections which we see are not due to the organisms which get into the wound at the time of the injury, but to bacteria which are introduced during efforts at first aid Copious hemorrhage, anxious relatives and friends, insistent demands for immediate treatment, often lead the physician or first-aid man to do things which cause irreparable damage"—MICHAEL L MASON, *Surg. Gynec Obstet.* August, 1939, p. 113

OBITUARY

LEONARD WILLIAMS

M D CLASG

THE genus homo, said Leonard Williams in his Cavendish lecture in 1927, inherits from his simian ancestors a certain playful devilry of spirit Certainly some such spirit permeated his own life and was responsible for the pungency and deliberate challenge of his writings and for his occasional conflicts with accepted orders The general reader will remember him chiefly for his terse and much quoted comments on modern habits of diet and hygiene and for his little books on minor maladies He died in London on Aug 20 at the age of 77

Leonard Llewelyn Bulkeley Williams was by birth, as by name, physiognomy and temperament, a Welshman He was the youngest son of David Williams, M P , of Dendraeth Castle, Merioneth shire, and was educated at Marlborough, *Glasgow University* and St Thomas's Hospital He qualified in 1886, and after studying in Germany and France went into practice at Sidmouth About 1900 he migrated to London as a consultant physician, and there he *interested himself in balneology*, editing the *Journal of Balneology and Climatology*, and began to write extensively on the endocrine, dietetic and habitual factors that influence general health He proved himself a skilful writer of entertaining prose with clear cut and often individual views He supported the Arbuthnot Lane school in blaming habitual constipation for many of the 'civilised' diseases and was an enthusiastic advocate of the natural rather than the commercially prepared foods Premature senescence he attributed largely to gluttony and crude cookery ("cookery is too often penury masquerading as magnificence "), and for a long life he prescribed hard work, moderation in diet punctuated by fasting, and plenty of fresh air *Obesity* was his bête noire and he particularly condemned pressing meat extracts and the like in acute illness In comparison with the ordinary British invalid,' he said "the forcibly fed Strasbourg goose is an ascetic

In 1915 Dr Leonard Williams took over the editorship of the *Medical Press and Circular* when Walsh retired, and during the war years he contributed a weekly paragraph always witty and often disrespectful, over the apt pseudonym 'Sanpis' He was physician to the French Hospital, the Metropolitan Hospital and the Miller Hospital Greenwich Since the war, apart from a multitude of short articles and papers, lectures and addresses – for he was as facile a speaker as a writer – he produced a succession of editions of his 'Minor Maladies and Wrote 'The Science and Art of Living Middle Age and Old Age' 'Obesity, and 'Growing Old Gracefully' Though his views were not always generally accepted, he practised them himself with as much vigour as he preached them to his patients

A friend of forty years standing writes "Leonard Williams was a great admirer of France, and one of the most useful things he accomplished was a better mutual understanding between French and English medical men A connoisseur of beautiful things, a witty conversationalist, genial among friends, with an appearance which grew increasingly striking with the years—it may be wondered why with all these gifts he did not achieve a still higher position in the profession I think the main reason was that he allowed his enthusiasms to outstrip his judgment Once seized with an idea he was apt to carry it to extremes This was particularly obvious in his views on diet Moreover he had a decided taste for controversy and was a bonny fighter Now he is at peace with all the world, and his friends will forget his faults of judgment, remembering with affection his charming companionship "

WILLIAM CARSON

M D BELF , M R C O G

Dr William Carson died on Aug 13in his fortieth year after a long and painful illness He was a young man of outstanding ability and great promise After an early struggle which would have daunted many a lesser spirit, he graduated at Queen's University, Belfast, with honours in 1922 After serving as a resident in the Maternity Hospital, Belfast, he held a similar appointment in the Soho Square Hospital for Women in London Later he was elected to the *staff of the Samaritan Hospital, Belfast*, and the Belfast Union Infirmary

His prime characteristics were his dynamic enthusiasm and an unflagging fund of good humour He was a versatile and resourceful surgeon, with a passion for accurate technique and a deep regard for the anatomical and physiological truths As a teacher his talents were obvious He was friendly and approachable and had a sympathetic appreciation of the student's difficulties

Carson possessed an original and inventive mind, and for years he was fascinated by the problems of carcinogenesis The specific effects of abortus infection on animal chorionic tissue suggested to him the possibility that they might be of use in destroying malignant tissues in man While studying the effects of these organisms on patients with cancer, he found his work hampered by the solid immunity which developed in all cases He decided that a normal control was essential and, in spite of the protests of his colleagues, he made himself the subject of further experiments These resulted in a violent and devastating porcine abortus septicæmia which raged for many weeks and *permanently impaired his health* He showed great fortitude and cheerfulness in the face of physical suffering

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Since 1936 London hospitals have joined to hold combined collections on three days of the year The general hospitals made their collection in inner and outer London during May On Tuesday Oct 10, the special hospitals will hold their flag day Those who wish to help should get in touch with the London Hospitals Street Collections Central Committee, 36 Kingsway, London, W C 2

UNIVERSITY OF LONDON —If a state of national emergency is declared no examinations will be held at the university till further notice

Notes, Comments and Abstracts

LIMITATION OF NUMBER OF PRACTICES

THE *enterprising young man who builds up practices*, one after the other, in order to sell them and move on is criticised by a correspondent in *Concours Médical* of June 4. He tells the story of a practitioner who set up in a district where hitherto there had been room for only one doctor, and in six years secured a large proportion of the patients. He then sold his practice to the highest bidder, settled down 40 kilometres away, and repeated the process. The next step was to settle in a large town as a supervisor of his fellow-practitioners working under the national health-insurance scheme. Being now a capitalist, through the ruin of two of his colleagues, he was in a position to live happily ever after, his income from investments supplemented by his government salary. The *Concours Médical* correspondent thinks such behaviour could be frustrated if a limit were put on the number of practices Already, it appears, French notaries must step into each others' shoes instead of making a new pair This system, it is suggested, would also be advantageous for the practitioner's widow; for at present she is liable to find the sale value of her husband's practice dwindling rapidly within a few days of his death, because a "squatter" has been free to jump the claim.

FOR THE AMATEUR DOCTOR

WHETHER the layman is in fact more helped than alarmed by his medical reading is a moot point. As long ago as 1907 the faculty of the Harvard medical school formed the opinion that "health-consciousness" had reached a stage which demanded that something should be done to satisfy public curiosity. A course of free and authoritative lectures on Sunday afternoons was inaugurated and these have since continued, almost without interruption Their aim has been "to clarify, explain and interpret recent developments in various fields of medicine and research, to warn of unsuspected dangers, and to stress the necessity of seeking sources of skilled advice," as apposed to procrastination or quackery. The volume before us ("Health at Fifty," edited by William H. Robey. London: Humphrey Milford, Oxford University Press. 1939. Pp 299. 12*s* 6*d*) comprises a dozen of the more recent lectures, dealing with heart disease, high and low blood-pressure, underweight and overweight, the cancer problem, rheumatism, menstrual disorders, vitamins, care of the eyes, hormones, the family medicine-chest, social stress and mental health, and old age. The manner of presentation is honest and accurate. There might be less anxiety about the activities of the amateur doctor if one could be sure that his information was derived from sources as reliable as this.

Vacancies

St Paul's Hosp. for Urological and Skin Diseases, Endell St, W C 2—Hon. Anæsthetist.
Albert Dock Hosp, Alnwick Road, E.16—Second Res M O, at rate of £110
Chester Royal Infirmary.—H S to ear, nose, and throat, and gynæcological depts, £150
Princess Louise Kensington Hosp. for Women, St Quintin Avenue, N. Kensington, W.10.—H P. and H S, each at rate of £120
Hospital for Sick Children, Gt Ormond St, W C 1—H P. and H S, each at rate of £50
Bolingbroke Hospital, Wandsworth Common, S W.11—R S O, £200 Also H P. and Cas O, each at rate of £120.
Wrexham and East Denbighshire War Memorial Hospital—R H S, at rate of £150.
Lancaster Royal Infirmary—2nd H S, at rate of £175
Mansfield and District General Hosp—H S, at rate of £150
Northampton General Hosp—H.S, at rate of £150.
Nelson Hosp, Merton, S W.20—Res H.S, at rate of £150
Salvation Army Mothers' Hosp, Lower Clapton Road, E 5—Jun Res. M O, at rate of £80.
Tottenham Borough.—Temporary Asst M O.H. (A.R P.), £550.
Manchester Withington Hosp—Asst to Res Obstet. Officer, at rate of £250. Also Res. Asst M O, at rate of £200
East End Maternity Hosp, 396 Commercial Road, E 1—R.M.O, at rate of £150

Medical Diary

Sept 4 to Sept 9

UNIVERSITY OF GLASGOW
TUESDAY—4 30 P M (Tennent Memorial Building, 38, Church Street) Prof A J Ballantyne Problems of Vision in Aviation

EDINBURGH ROYAL INFIRMARY
THURSDAY—5 P M, Dr James Slater Physical Education in the University of Edinburgh (Honyman Gillespie lecture)

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W 1
MONDAY to SATURDAY WEST END HOSPITAL FOR NERVOUS DISEASES, Regent's Park, Mon and Fri, 8 P M, lecture-demonstrations in neurological surgery for F R C S (final) candidates—BROMPTON HOSPITAL, S W 3, Tues and Wed, 5 15 P M, course in chest diseases, for M R C P candidates MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W 1, *Mon, Wed, and Fri, 5 15 P M, course in physiology for primary F.R C S candidates*—ROYAL CHEST HOSPITAL, City Road, E C 1, 8 P M, lecture-demonstrations in chest and heart diseases (Open to non-members)—ST MARY'S HOSPITAL, Paddington, W 2, Tues and Thurs, 8 P M, clinical and pathological M R C P course

Births, Marriages and Deaths

BIRTHS

BALL.—On Aug 24, at Barton-on-Sea, the wife of Dr Harold C J Ball—a daughter
BEALL.—On Aug 26, at Chatham, Ontario, the wife of Dr Geoffrey Beall—a son
CARNEGIE BROWN.—On Aug 21, at Wool, Dorset, the wife of Dr G Carnegie Brown—a son
CHEVERTON.—On Aug 23, at Belize, British Honduras, the wife of Dr L Cheverton—a daughter
COFFEY.—On Aug 18, at Muswell Hill, N 10, the wife of Dr W. J Coffey—a daughter
GOOD.—On Aug 25, the wife of Dr Michael S Good, of Aylesbury—a son
HERTZOG.—On Aug 21, at Ramsey, Huntingdon, the wife of Dr Willem Hertzog—a son
JACKSON.—On Aug 28, to Dr Margaret Jackson (nee Hadley), the wife of Dr L N Jackson, of Crediton, Devon—a son
KING LEWIS.—On Aug 25, at Bromyard, Herefordshire, the wife of Dr P C King Lewis—twins, a son and a daughter
LAURENT.—On Aug 23, at Putney, the wife of Dr A M P Laurent—a son
REID.—On Aug. 22, the wife of Dr A. Reid, of Clare, Suffolk—a son
WILLIAMS.—On Aug 23, at Southsea, the wife of Surgeon Commander J V. Williams, R N.—a son

MARRIAGES

ROWORTH—READE.—On Aug 21, at Woodham Church, Charles Guy Roworth, M D., to Christine Sylvia Reade

DEATHS

COCKBURN SMITH.—On Aug 22, at Newton Abbot, George Cockburn Smith, M D Brussels M R C S, aged 92
FLEMMING.—On Aug 25, Arthur Launcelot Flemming, M D Brist, of Clifton, Bristol
HAYES.—On Aug 26, at Carr Bridge, James Hayes, M R C S, of Tunbridge Wells, aged 83
KOCH.—On Aug 28, Wilfred Vincent Miller Koch, M D. Edin., of Bath, late of Hong-Kong
STAFFORD.—On Aug 18, at Nottingham, William Stafford, M B Glasg
THOMPSON.—On Aug 24, at Paignton, John Thompson, F R C S.

Appointments

WRIGHT, FRANCES T, M B Manc, assistant medical officer at the outpatient department of the Royal Manchester Children's Hospital

Medical News

University of Cambridge

Dr. Peter Kerley has been appointed an examiner for the diploma of medical radiology and electrology (part II) in place of Dr. Russell Reynolds, who has resigned

Titles of degrees were conferred on the following members of Girton and Newnham Colleges during July:

A. G Gardham, M.B; W. F. Holman, M B, B Chir; R. M Howitt, M.B., B Chir; A M Lewis, M.B., B Chir., M. Savory, M.B, B Chir.; and M J Scott, M B., B Chir.

ADDRESSES AND ORIGINAL ARTICLES

ACUTE RHEUMATIC CARDITIS*

BY W T RITCHIE, O B E, M D Edin, F R C P E

PROFESSOR EMERITUS OF MEDICINE AND OF CLINICAL MEDICINE IN THE UNIVERSITY OF EDINBURGH

THE most frequent, and from the economic and social aspects the most important, form of myocarditis is unquestionably that due to rheumatism Other infective diseases have been eradicated from our land or are being brought under control, but rheumatic fever is still a prevalent scourge, rivalling if not surpassing tuberculosis as a cause of sickness and death A recent inquiry revealed that 1 in 8 of all medical inpatients in the principal hospitals of Edinburgh was affected with rheumatic heart disease, and that 52 8 per cent of all cases of heart disease in our Royal Infirmary were of rheumatic origin

The number of problems concerning rheumatism that still await solution is untold Its causation has not yet been determined, its relation to environmental factors, its infectivity and allergic nature are still uncertain (Hench et al 1938) We do not know why one child and not another, whether poor or rich, town dweller or country bred, falls a victim to rheumatic fever and is in imminent danger of becoming a cardiac cripple We have but a fragmentary knowledge of the end results of rheumatic heart disease when the circulation is failing On these matters I shall not dwell, but, although I may be thought "to carrie owles to Athens," I shall present some observations on acute rheumatic carditis

During a period of sixteen and a half years ending last autumn there were 268 cases of rheumatic fever, 127 males and 141 females, under my care in hospital Of these 43 per cent (51 males, 66 females) were between the ages of eleven and twenty, 65 per cent (75 males, 98 females) were between eleven and thirty The oldest was a woman aged sixty four, the youngest a girl aged six

Incidence

Of the 170 patients† observed in 1922–34 52 per cent were admitted during a first attack of rheumatic fever, 48 per cent during an exacerbation or recurrence, 6 per cent had previously suffered from chorea, and 47 per cent gave a history of existing or recently antecedent infection of the upper respiratory tract—e g, tonsillitis, pharyngitis, bronchitis, and sinusitis—or of aural sepsis In 2 cases acute appendicitis played the initiatory part usually taken by septic tonsils in the tragedy of rheumatic carditis Of these 170 cases there was acute polyarthritis in 157 (87 per cent) and carditis in 95 (53 per cent) In 47 1 per cent of the carditis cases the damage to the heart began during a first attack of rheumatic fever, in 47 1 per cent during a second attack, and in 3 8 per cent during a third attack Thus in 90 5 per cent of the carditis cases the heart became damaged during either a first or a second attack of rheumatic fever, and most of those thus affected were between the ages of eleven and twenty The risk of carditis lessens as the individual grows older Endocarditis, recorded in 89 cases (49 6 per cent), was considered to be "primary," not an exacerbation or recurrence, in 41 (22 9 per cent) Clinically this affected the mitral valve alone in 82 6 per cent, the mitral and aortic valves in 16 5 per cent, and the aortic valve alone in 0 9 per cent Pericarditis was observed in 35 cases (19 5 per cent), of which presented evidence of endocarditis also.

Diagnosis

Rheumatic carditis is in many respects analogous to tuberculosis The disease may be as quickly fatal as is miliary tuberculosis, or it may be a chronic process in which inflammatory fibrous tissue impairs the mechanical efficiency of the affected organ. The recognition of the beginning of both diseases is beset with difficulties That of carditis is often a mere supposition, because it usually begins insidiously during an attack of apparently uncomplicated rheumatic fever and develops gradually into a subacute or chronic process Many months, even years often elapse before the carditis is first recognised in the form of mitral stenosis or chronic myocardial failure

While the carditis is still in an early phase of development, cardiac enlargement can seldom be detected even by radiography, but the myocardial damage can sometimes be revealed by electrocardiographic abnormalities (Shookhoff and Taran 1931) similar to those arising during the course of other infective diseases, notably diphtheria and Chagas' disease (Chagas and Villela 1922, Chagas 1935). In a personal study of 100 cases of rheumatic fever 20 yielded normal electrocardiograms, auriculoventricular conduction time was longer than 0 19 sec in 37, and branch block or partial auriculoventricular block was found in 11 These changes usually disappear during convalescence (Parkinson, Gosse, and Gunson 1919–20) but may persist if there are obvious clinical signs of active carditis Unless obviously due to digitalis (Thomson 1934), conduction defects in rheumatic fever are usually considered to be indications of non specific inflammatory processes and vascular lesions in and around the conducting system of the heart (Walter 1938) Since the defect may be abolished by atropine (Bruenn 1937) it may also be due in part to an increase of vagal tone, this being probably a result of over activity of vagal nerve endings in the heart (Keith 1938) The deflexion T was inverted, diphasic, or otherwise abnormal in 9 cases Serial records by standard limb leads are useful in showing when abnormalities of T begin and whether they pass away Chest leads both apical and sternal, were used in 10 cases of rheumatic carditis, 8 being mild, 2 severe, 2 disclosed an abnormality of T which was not shown by the standard limb leads Right axis deviation was found in 13 and left axis deviation in 12, both are more frequent in recurrent attacks than in a first attack of rheumatic fever Ventricular extra systoles were recorded in 6 cases and auricular fibrillation in 5 Interference dissociation (Bain 1939) was never recorded In rheumatic fever without apparent carditis electrocardiograms, especially daily records by chest leads, afford a delicate means of revealing early damage to the myocardium, but they are often normal although the clinical evidence of carditis is beyond doubt

In a second, less frequent group of cases the carditis begins more acutely, the fever persists perhaps for several weeks, the heart's rate remains too fast even although the fever has subsided, endocardial murmurs

* The St Cyres lecture for 1939 delivered on June 8
† I have to thank Dr F H Vann for an analysis of these cases

become audible, and the sedimentation-rate remains high. Electrocardiograms are not needed for diagnosis; they are more often abnormal but may present no significant alterations a fortnight before an acute case ends fatally. If the patient survives, the inflammatory process in the heart ultimately undergoes fibrosis but, like a tuberculous lesion in the lung, it seldom heals, it merely becomes quiescent and is repeatedly liable to exacerbation. Thus, in the course of years there may be many cycles of activity alternating with quiescent phases, each of which may last for years.

A third, and smaller, group comprises the monocyclic cases in which the disease begins acutely, continues for days, weeks, or months, and usually ends fatally. It sometimes pursues a fulminant and speedily fatal course The most striking example is that rare and mysterious condition, rheumatic hyperpyrexia. In 2 instances this arose during a first attack of rheumatic fever and in 2 during a recurrence, the temperatures rising to 106 7° F. on the fifteenth day, 108° F. on the sixteenth day, 108 8° F. on the seventh day, and 109° F on the sixth day respectively. Neither the antecedent history nor the early features of the illness in these 4 cases gave any premonition of impending death Another virulent and fatal form of rheumatic carditis, fortunately rare, resembles acute septicæmia with a purpuric eruption, to which Libman (1923) directed attention This eruption is to be distinguished from that in subacute bacterial endocarditis and from a scorbutic eruption in chronic congestive heart-failure.

Of the many conditions for which acute rheumatic carditis may be mistaken the commonest is the febrile polyarthritic form of gonococcal arthritis, in which the complement-deviation test is, in my experience, always negative. Repeatedly negative blood-cultures and the absence of splenic enlargement and of Osler's nodes are foremost signs that help us to exclude subacute bacterial endocarditis. Acute staphylococcal osteomyelitis and pyæmia may deceive even a physician of ripe experience, especially if a cardiac complication, such as acute pericarditis, is an early sign, or if the pyrexia begins to subside after the administration of salicylate The presence of subcutaneous rheumatic nodules, erythema marginatum (Keil 1938) or erythema nodosum (Edström 1937) will help to exclude carditis of septic origin I have seen the initial phase of an intensely acute rheumatic carditis simulate enteric fever and abortus fever. In one case the onset of jaundice on the seventh day, yielding an icterus index of 33, suggested leptospirosis until that disease was excluded by agglutination and inoculation tests. The differentiation from acute tuberculosis seldom occasions any difficulty.

Prognosis

Except in fulminant cases the immediate prognosis is usually favourable; but it is grave if the aortic as well as the mitral valve become affected, if the pyrexia be prolonged for several weeks, if pronounced tachycardia persist after the patient has become afebrile, and if the heart fail and the lungs and liver become congested and the lower limbs dropsical. Even such a patient, however, may survive the acute phase of the disease and be leading a useful and happy life several years later. Sodium salicylate is powerless to arrest or to mitigate carditis; the efficacy of scarlet-fever antitoxin and other forms of serotherapy and of subcutaneous injections of hæmolytic streptococcal endotoxin is still open to doubt. Sulphanilamide is, I am convinced, not merely ineffective but also may aggravate the arthritic pains and increase the temperature.

A final opinion cannot yet be given upon the prognostic significance of electrocardiographic abnormalities in acute rheumatic carditis. Some writers (Robinow et al. 1936, Bland and Jones 1938) regard them as of little or no value; others (Grenet et al 1939) comment on the grave significance of S-T abnormalities persisting for more than a month, auricular fibrillation, and progressive deviation of the electric axis In my opinion the prognosis in this, as in all other affections of the heart, should never be founded solely or even mainly upon any one method of studying the morphological and functional state of the organ

While still under my observation 26 patients (9 7 per cent) of the series of 268 died, 14 being between the ages of eleven and twenty-five and 8 being over twenty-five; 9 died during a first attack of rheumatic fever, 3 had one attack before the fatal recurrence, 8 had repeated attacks, and 6 died of congestive heart-failure without any fresh clinical manifestations of rheumatic fever This classification (Gross and Ehrlich 1934) is misleading in respect of the fourth group, because at least 2 of the 6 patients in that group had acute carditis implicating the tricuspid, mitral, and aortic valves, this being in accord with the well-established fact that in a high percentage of fatal cases of rheumatic heart-disease there is active carditis which has seldom been recognised during life.

Morbid Anatomy

Fourteen cases were examined post-mortem by *Prof A. Murray Drennan and members of his staff*, to whom I gladly acknowledge my indebtedness for help in this investigation Even although there are obvious rheumatic lesions of the pericardium and cardiac valves, it is exceedingly doubtful if acute rheumatic carditis can be recognised without microscopical examination.

HEART

The anatomical changes in the heart are due in various degrees to (1) non-specific exudative, degenerative, and infiltrative processes comparable to similar changes in tuberculosis; (2) lesions of mesenchymal cells of connective tissue—the "connective-tissue skeleton" (Poynton 1928, 1936)—and of blood-vessels, leading to the formation of the specific granuloma, Aschoff nodule, or Aschoff body; (3) *vascular lesions*, and (4) *lesions of myocardial fibres* The degree to which these changes attain varies greatly in individual cases according to the intensity and duration of the disease.

(1) *The non-specific changes* are similar to those in other states of infection, toxæmia, and the hyperergic response to foreign protein (Klinge 1933a). We constantly find *fibrinoid degeneration of collagen* connective-tissue fibres, mainly perivascular in distribution, œdema usually more diffuse, and leucocytic infiltration. These changes, which collectively represent the Arthus phenomenon (Werner 1938), begin concurrently, before any specific rheumatic lesions have developed, yet may persist throughout. Fibrinoid degeneration was most intense in the heart of a woman, aged thirty-two, who succumbed ten and a half weeks after the onset of rheumatic fever Œdema of the myocardium, analogous to exudation of fluid into a joint, was particularly severe in a girl, aged nine, who had extensive rheumatic vegetations on the mitral valve. The cellular infiltration, mainly lymphocytic, is sometimes scanty

and at others intense, especially in and near the attachment of the cusps of affected valves. Fatty change in myocardial fibres is common. Necrosis is rare, it was most pronounced in a boy, aged fourteen, whose final recrudescence of rheumatic fever with endocarditis of mitral, aortic, and tricuspid valves lasted a month.

(2) *The specific rheumatic granuloma*, or Aschoff nodule, was sought for in 12 and found in 9 cases, abundantly in some and scantily in others. These microscopic nodules are more numerous in the ventricles than in the auricles, to this rule there was one exception. Lying usually in close proximity to myocardial arterioles, less often subserous, they consist of basophilic mesenchymal cells, some of which are multinucleated giant cells, and of collagen which has undergone fibrinoid degeneration and stains deeply with eosin. At first spherical, the nodules become successively oval and fusiform, gradually they become fibrosed, and late involution forms are represented by scars.

Following Klinge (1933*b*) we may differentiate young nodules less than four weeks old from those more mature and from late involution forms. Nodules in various stages of development, young and old, may often be seen in one and the same section. No attempt was made to classify nodules according to the criteria laid down by Gross and Ehrlich (1934), who recognised seven types, but the "mosaic" forms in perivascular, endocardial, and subendocardial sites can readily be distinguished from "reticular" forms in loose connective tissue. At the periphery of a nodule and around it there is sometimes a zone of lymphocytic infiltration. In acute cases, especially those ending during the ninth week of a first attack of rheumatic fever, the cells of the nodules are said to undergo fusion and great enlargement, forming "huge syncytial masses" which surround the scanty central collagen material (Gross and Ehrlich 1934). There was no case of this nature in my series. The Aschoff nodule, which must not be mistaken for a focal aggregation of leucocytes, is almost universally considered to be specific for rheumatic fever, as is the Langhans giant cell system for tuberculosis and the Greenfield (1878) multinucleated cell system for lymphadenoma. Subcutaneous rheumatic nodules have essentially the same structure as Aschoff nodules in the heart. Widespread dissemination of nodules in the pharynx, larynx, trachea, œsophagus, and elsewhere has been reported (Sarafoff 1932), a search for nodules in those sites in one of my cases proved fruitless.

If a case ends within a fortnight of a first acute rheumatic attack, Aschoff nodules, it is said, have not yet developed, only initial non specific inflammatory lesions will be found (Klinge 1933*b*), and they will be widespread if the disease has been particularly severe (Skworzoff 1938). Indeed, non specific exudations and infiltrations and gross destruction of muscle-fibres are regarded by Fahr (1938) as the morphological basis of hyperpyrexic rheumatic fever. In a man, aged thirty four, who developed wild maniacal delirium when the temperature rose to 106·7° F. on the fifteenth day of a recurrence we found fully formed but not fibrosed Aschoff nodules with small perinodular zones of leucocytes and considerable œdema of the myocardium but little fibrinoid degeneration and no serious destruction of muscle fibres. In a woman, aged twenty five, whose temperature rose to 108·8° F. on the seventh day of a first attack of rheumatic fever we found many young Aschoff nodules but, except for œdema, few non specific changes. In three hyperpyrexic cases a large soft spleen and numerous small subpleural or subepicardial hæmorrhages, and in one a large subendocardial hæmorrhage, indicate an analogy between hyperpyrexial rheumatic fever and an acute septic infection.

(3) *Vascular lesions* of the coronary arterial system are common. Most of them are non specific and of similar nature to those in many general infections, as described by Cowan (1904). His early observations have been extended by many subsequent writers, notably Coombs (1908–09), Perry (1930), who has shown that in rheumatic fever the whole of the coronary tree is liable to be damaged, Klinge (1933), Chiari (1938), and Karsner and Bayless (1934). In a girl, aged seventeen, whose death was due to a third recurrence of acute rheumatic carditis the main coronary arteries showed diffuse unequal intimal thickening with patchy hyalinisation of the media, sparse round cell infiltration, and fragmentation of the elastica. Intimal hyperplasia of small myocardial branches, whereby their lumen becomes greatly reduced, is a common but not invariable lesion. Intimal œdema was most conspicuous in a girl, aged nine, an acute monocyclic case of five months' duration. Medial œdema, causing the "reticular state" described by Rabé (1902), was best seen in a girl, aged eleven, whose kidneys were the seat of cortical necrosis. In the adventitia we find œdema and hyperplasia, it is in the adventitia of myocardial arterioles that Aschoff nodules usually develop. The coronary lesions are not identical in each case or in all parts of the coronary tree. They may be mainly intimal in some vessels and medial in others, there may be gross œdema of the myocardium yet little œdema of the walls of coronary branches. In none of my cases was there *necrotising arteritis* (Gross, Kugel, and Epstein 1935) or thrombosis with myocardial infarction (MacCallum 1923, Schwarz 1932).

Although the coronary vessels are more often and more seriously implicated than other portions of the vascular system, similar but usually less intense lesions may develop in any part of the aorta (but mainly in its abdominal portion) and in the pulmonary arteries and mesenteric arteries (Chiari 1932, 1938). More than thirty years ago Huchard (1905) recognised acute rheumatic aortitis. Pappenheimer and VonGlahn (1927) described a diffuse reaction of the intima and subjacent part of the aortic media, comparable to that of the auricular endocardium (MacCallum 1925), and focal lesions following the distribution of vasa vasorum which have been shown to penetrate the wall of the aorta and other arteries from within as well as from without (Winternitz et al. 1938). Infiltration of all three coats of the aorta with cells, mainly lymphocytes and plasma cells, and "mucoid" swelling and cystic change of the media, with fibrinoid and œdematous swelling of connective tissue and occasional Aschoff nodules, are reported by Klinge and Vaubel (1931), Schulz and Klinge (1933), and Lieber (1937). At the root of the aorta and that of the pulmonary artery the commonest lesion, according to Kugel and Epstein (1928) is a diffuse cellular infiltration, which, they suggest, may account for some of the transient auscultatory signs arising during rheumatic fever. Relative pulmonary incompetence in that disease has been ascribed by Scherf (1930) to these lesions. I cannot recall any case of this nature, but a comparable defect at the aortic valve, which was intact at autopsy, once came under my notice. Fibrous scars in the walls of aorta and pulmonary arteries may be found in the subjects of old inactive rheumatic disease (Wild 1933, Rössle 1933).

(4) *The myocardium*.—Attention has already been drawn to the all-important matter, the state of the myocardial fibres. Granular degeneration, fatty change, hyalinisation, and atrophy are often seen; necrosis is less common and less extensive. The formation of Aschoff nodules in the valves of the heart and their subsequent fibrosis may be as significant as the non-specific inflammatory changes in causing rheumatic valvular defects; but the clinical manifestations of myocardial weakness are to be ascribed not to the development of Aschoff nodules in the walls of the heart but to the action of a rheumatic toxin on the myocardium and to its ischæmia consequent on non-specific exudations, degenerations, and infiltrations.

BRAIN

Although the heart is the organ most often injured by rheumatic fever, there is a close association between acute rheumatic carditis and rheumatic affections of other viscera, notably the brain, lungs, and kidneys. The character and multiplicity of the cerebral lesions in Sydenham's chorea (Gamper 1935) lie beyond the scope of this lecture, but reference may be made to other cerebral affections. In 10 cases of the present series there developed delirium and other acute psychoses, which passed off except in 1 fatal hyperpyrexial case. There was cerebral embolism in 1 case and cerebral œdema in 1, a man, aged forty-one, who had a terminal epileptiform seizure. A case of much interest was a girl, aged thirteen, who developed headache, rigidity of the neck, and a meningitic cry twelve hours before death. In the frontal and parietal cortex of both sides Dr A. C. P. Campbell found multiple small (1–2 mm.) foci of ischæmic degeneration, some recent, showing pyknotic and necrotic nerve-cells without glial reaction, and others older, showing contraction and fibrous gliosis. Arterioles here and there were plugged with granular eosinophil masses of thrombus, presumably embolic. There was no sign of meningitis. This case, which resembles one of Edström's (1937), was not one of subacute bacterial endocarditis, in which infarcts are common, the clinical history and the lesions in the heart were characteristic of rheumatic carditis. In similar cases of "cerebral rheumatism" endarteritis of small cerebral vessels and acellular areas in the brain have been recorded by Winkelman and Eckel (1932).

LUNGS

Specific rheumatic lesions are seldom found in the lungs (Debré et al. 1937) but may be seen in the interlobular septa (Fraser 1930). Neither they nor the subpleural hæmorrhages in fulminant cases cause clinical symptoms. Non-specific processes are more important and have been regarded as integral components of the disease (Gouley 1937). Acute pulmonary œdema, due to left ventricular failure, is rare; I have seen 2 cases; both ended fatally. Chronic venous congestion and œdema of the lungs are commoner. In severe cases of acute rheumatic carditis we may find collapse of the lower lobe of the left lung from compression of the bronchi by pericardial effusion or a greatly dilated heart; reflex immobilisation of the diaphragm has been claimed as another causal factor (Coombs 1924). In respect of its site, physical signs, and clinical course this basal pulmonary collapse is virtually identical with the condition termed "rheumatic pneumonia." This was observed in 9 patients, their ages ranging from seven to twenty-nine. The patch of consolidation, which is almost always at or near the angle of the left scapula, may be extensive or no larger than a half-crown piece. The X-ray appearances of the left lung field may indicate merely venous congestion (Gouley 1937) or be sufficiently distinctive to confirm the clinical diagnosis of consolidation. All 9 patients were gravely ill; of 6 who survived 1 was playing football six months later despite mitral stenosis. In a girl, aged fifteen, with dry pericarditis and a greatly dilated heart the left lower lobe was found at autopsy to be merely congested. In another fatal case, a girl, aged nine, with a greatly enlarged heart but no pericarditis, there was likewise no consolidation of the lung. Neither case presented lesions intermediate between infarcts and pneumonia (Mallory 1935) or firm patches of acute interstitial pneumonia "like solid indiarubber" (Fraser 1930). In other cases of "rheumatic pneumonia" there is gross hæmorrhage in the pulmonary tissues (Bland and Jones 1938), or there are focal areas of "splenisation"—namely, intense hyperæmia and proliferation of cells of alveolar walls (Melnick 1938) and their capillaries (Naish 1928). Proliferative alveolitis and intimal desquamation, followed by fibrinoid necrosis of the walls of alveoli, alveolar ducts, and bronchioles (Debré et al. 1937), and fibrinoid alveolitis with formation of hyaline membranes in the alveolar ducts, a process similar to that of acute fulminant pneumonia in influenza and of pneumonic plague (Hadfield 1938), have been recorded. Acute bronchopneumonia was observed in 2 cases and infarction of the lung in 2 others.

Pleurisy was found in 8 cases, and in 6 of these there was a sterile pleuritic effusion. The prognosis in these cases is almost invariably grave, but a boy, aged sixteen, was apparently well five months later. I have never seen either rheumatic pleurisy or rheumatic consolidation of the lung except in association with serious rheumatic carditis, failing which a provisional diagnosis of acute rheumatic disease of pleura or lung had always to be abandoned.

KIDNEYS

There is seldom clinical evidence of any renal affection except transient albuminuria during febrile phases of the illness. Even in fatal cases of acute rheumatic carditis microscopical examination of the kidneys sometimes discloses no abnormality. They were diseased in 4 of my cases.

CASE 1.—A woman, aged twenty-eight, who had experienced an initial attack of rheumatic fever at fifteen, was suffering from a second attack with severe polyarthritis and signs of acute and chronic carditis but no dropsy. The daily excretion of urine seldom fell below 1 litre and occasionally it rose to 2 litres. The urine was sterile and contained albumin, blood, and epithelial and granular tube-casts throughout her stay of ten weeks in hospital. The blood-urea nitrogen was 19–22 mg., the non-protein nitrogen 37–41 mg., and the creatinine 3·3–3·6 mg. per 100 c.cm. The arterial blood-pressure varied from 130/70 to 100/70.

CASE 2.—A thirty-five a miner suffered from rheumatic fever. At thirty-nine he was febrile and breathless and he passed 1100–2200 c.cm. of urine daily, which contained albumin and blood. The kidneys showed old focal scars and recent glomerular changes—namely, cell-proliferation, thrombosis in tuft vessels, and adhesion to capsule. The mitral and aortic valves showed acute and chronic rheumatic valvulitis, and many Aschoff nodules in various stages of development were seen. The glomerular lesions in this case resemble those described by Bell (1932), who found a moderate degree of acute diffuse glomerulitis in 21 per cent. of 101 cases of active rheumatic carditis.

CASE 3.—A girl, aged seventeen, who had suffered from rheumatic fever at twelve, thirteen, and sixteen, had an acute exacerbation which ended fatally in four months. During the terminal three weeks the face was pale and puffy and the urine contained albumin and traces of blood. The blood-urea nitrogen was 35 mg. per 100 c.cm. There was acute diffuse inflammation of the glomeruli, their tufts were swollen and highly cellular, the excessive cells being round cells or proliferated endothelium, and there were no vascular or interstitial changes in the kidneys.

Acute glomerulonephritis, whether of toxic origin or secondary to non-specific vascular lesions, is rare in rheumatic fever. Goldring and Wyckoff (1930) did not find nephritis in any of their 16 patients, Bachr and Schifrin (1932) found 1 example in 118 cases, Fishberg (1939) saw only 2 undoubted cases, in Edström's (1937) 850 cases there were 17 of acute glomerulonephritis, Klinge (1932) has observed a series of cases with focal glomerulonephritis and subacute diffuse glomerulonephritis with hæmaturia, tube casts, and retention of nitrogen. Acute nephritis was found in 10 of Salveson's (1938) 212 cases of rheumatic fever. The nephritis is usually mild, takes a favourable course, and ends in complete recovery, but 2 of Salvesen's cases developed uræmia, and Loeb's (1931) patient, that of Bachr and Schifrin (1932), and 4 of Edström's (1937) patients died of uræmia.

Vascular lesions in the kidneys are also seen apart from glomerulonephritis. VonGlahn and Pappenheimer (1926) regarded exudation of fibrin with destructive and cellular changes in and around the vessels as specific. Klinge (1933c) constantly finds perivascular lymphocytic infiltration, especially in the cortex, glomeruli, arteries, arterioles, and veins may be surrounded by dense zones of lymphocytes. In 1 of his cases there were perivascular cellular nodules, like berries hanging on a stalk, with arterio- and arteriolo-necrosis of adjacent vessels, as previously described by Fahr (1921). The endothelium may be swollen and proliferated (Bachr and Sacks 1923), but intimal lesions are inconstant (Blaisdell 1934). Rheumatic granulomas in the kidney are exceedingly rare, it is doubtful if they alone ever cause glomerular and tubular lesions.

CASE 4.—A girl had rheumatic fever at eleven. At thirteen she suffered from a second attack with carditis. A year later congestive heart failure with dropsy supervened. The mitral and aortic valves showed acute and chronic valvulitis, there were acute rheumatic vegetations on the tricuspid valve; and in the myocardium were old and recent Aschoff nodules but no vascular lesions. Both kidneys showed cortical necrosis extending inwards to a depth not exceeding 2 mm. In the cortex were also acute cellular foci resembling the perivascular nodules described by Klinge (1933c). Reference has already been made to the focal cerebral lesions in this case. There was no indication of the cortical necrosis being secondary to thrombosis in cortical vessels and glomeruli, or of necrosis and fibrinoid degeneration in the walls of interlobular arteries, as described by von Zalka (1933).

So far as is known, the only previous case of cortical necrosis of the kidneys in acute rheumatic carditis was one in which the renal arteries were the seat of proliferative and necrotic lesions of such intensity that necrosis of the entire cortex of both kidneys ensued (Sacks 1925–26).

The other abdominal viscera are less often affected. Jaundice, a rare complication, may indicate a rheumatic hepatosis rather than hepatitis. Granular, fatty, and necrotic changes of liver cells are not specific. Aschoff nodules have been found in the capsule of the liver (Klinge 1932). There may be nodular hyperplasia and necrosis of the intima of veins within the organ (Rössle 1933), and a similar endophlebitis has been found in the spleen and pancreas (Coronini and Oberson 1937).

Conclusions

To what conclusions does a study of acute rheumatic carditis lead us? We realise more fully the risk of cardiac lesions arising during the course of rheumatic fever. It is true that in some cases those lesions must be transient, because life assurance companies subsequently accept those lives as first class and old age is attained in the enjoyment of good health. At the other extreme is the grave case in which profuse lesions in the walls of the heart and one or more of its valves lead to a fatal issue. If the patient survives the early acute phase, the cardiac lesions have presumably been less intense and less extensive, but he will almost certainly become a cardiac cripple. Even although the valves remain intact, the myocardial lesions may lead to fibrosis and thus to hypertrophy and dilatation of the heart without any valvular fault that might entail an increase of the heart's work. Further, the more we know of the vascular and visceral changes in rheumatic fever, the better do we realise that the damage is not confined to the heart but may be much more extensive. I have never been able to subscribe to the rheumatic origin of peritonitis (Poynton 1928), polyserositis (Edström 1937), mesenteric lymphadenitis (Ash 1936), acute appendicitis, and other abdominal disorders in childhood (Guptill 1934, Wolffe and Brim 1936), nor have I seen a "rheumatic aneurysm" (Edström 1937), but acute vascular lesions in coronary arteries and arterioles and in the aorta and pulmonary arteries may perhaps be the starting point of chronic degenerative changes in those vessels. Moreover various forms of granular contracted kidney, including malignant nephrosclerosis, it is thought, may be end-results of acute rheumatic vascular and glomerular lesions (Klinge 1932, Fahr 1938). The hypothesis that ascribes the origin of arteriosclerosis, as distinct from atheroma and medial calcification, to widespread rheumatic vascular lesions, systemic and splanchnic, has as yet little to commend it.

A deeper insight into the nature and extent of visceral rheumatism indicates clearly that the cardinal principles in the treatment and management of patients affected by rheumatic carditis should be followed as strictly and ceaselessly as is customary in the care of those who suffer from tuberculosis. Our goal, however, is not the treatment of the cardiac cripple but the prevention of rheumatic fever by a strict adoption of all appropriate measures of personal and social hygiene.

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FAMILIAL ADENOMATOSIS OF COLON AND RECTUM

ITS RELATIONSHIP TO CANCER

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IN adenomatosis of the colon and rectum (polyposis intestini) the whole mucosal surface of the rectum and colon is studded with innumerable adenomatous proliferations of the mucous membrane. The disease usually affects several members of a family and almost invariably leads to carcinoma.

A description of this disease, with the records of three families, given by one of us (Lockhart-Mummery 1925) concluded with the following summary:—

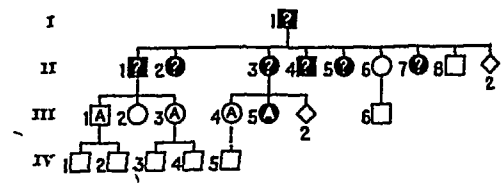
(1) Adenomatosis of the large bowel is a condition which tends to develop in succeeding generations in the same family. (2) Individuals with multiple adenomata of the large bowel almost invariably develop cancer in one or more of the adenomata after a few years. (3) The members of families with a hereditary tendency to multiple adenomata tend to die of cancer of the large bowel, and at an early age.

The experience of the last fourteen years amply confirms these conclusions. We have had an opportunity during this period of observing the course of the disease in ten families, whose history is recorded in the accompanying genealogical tables (families I–X), which very convincingly demonstrate the general familial character of the disease and its close relationship to cancer. The information set out in these tables has been derived from various sources. The starting-point in each case was a patient with adenomatosis. We obtained as complete a family history as possible from the patient, asking particularly about the present health or cause of death of parents, grand-parents, uncles, and aunts. Almost invariably we found that the patient was aware of the high incidence of death from intestinal cancer amongst his relations. We tried to get in touch with as many as possible of the surviving relations and to carry out sigmoidoscopic examinations. It was impossible to find out whether or not deceased relations had also been affected by adenomatosis; hence we have marked these cases with a ? in the tables to show that they died of cancer of the intestine, but that we have no information about adenomatosis. Probably in most cases the fatal cancer was secondary to adenomatosis. Some of the surviving descendants marked in the charts as unaffected may develop the disease in the future.

Although this disease is familial it does not manifest itself as a rule before childhood or puberty. The age at which adenomata begin to develop varies in different families. We tried to collect data on this point and in twenty cases obtained information which seemed to be reliable. The average age at which adenomata were discovered was 22. The youngest patient was 8 and the oldest 43. The tumours were probably present for at least a year or two before they were discovered; so the average age at which adenomata developed may be taken as about 20. In two families recently investigated by McKenney (1936) the average age was 19½.

Malignant disease secondary to adenomatosis is characterised by its early age of onset and the fact that more than one primary focus of carcinoma may

FAMILY I



I—(1) Death from cancer of rectum, aged 42.
II—(1, 2, 3, 4, 5, 7) Death from cancer of rectum, aged 46, 52, 54, 39, 27, and 44 respectively.
III—(1) Adenomatosis developed at 43 years, now aged 55, no sign of carcinoma. (3) Multiple adenomata found at 37 years, now aged 40; no sign of carcinoma. (4) Multiple adenomata found at 11 years, colectomy for adenomatosis at 31 years; no sign of carcinoma, now aged 46 and in good health. (5) Death from cancer of colon, aged 33.

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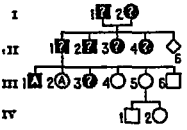
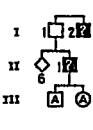
FAMILY II



FAMILY III



FAMILY II—I—(1 and 2) Death from cancer of rectum (ages unknown)

II—(1) Death from cancer of rectum, aged 44 (2, 3, and 4) Death from cancer of rectum (ages unknown)

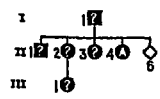
III—(1) Colectomy for multiple adenomata at 30 years, died from cancer of rectum, aged about 36 (2) Adenomata found at 14 years, colectomy at 25 years, now aged 46 (3) Death from cancer of the liver (age unknown)

FAMILY III—I—(2) Death from cancer of rectum, aged 60

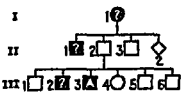
II—(1) Death from cancer of rectum, aged 46

III—(1) Treated for adenomatosis since 12 years of age, now aged 41 (2) Colectomy for adenomatosis at age 22, has remained well since (12 years)

FAMILY IV



FAMILY V



FAMILY IV—I—(1) Death from "cancer in pelvis," aged 62

II—(1) Death from cancer of rectum, aged 32 (2) Death from "abdominal growth," aged 45 (3) Death from cancer of rectum, aged 38 (4) Perineo-abdominal excision for cancer of rectum, aged 38; died from recurrence one year later

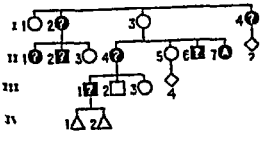
III—(1) Death from "abdominal" cancer (age unknown)

FAMILY V—I—(1) Died aged 40 after operation for cancer

II—(1) Death from intestinal cancer (age unknown)

III—(2) Death from intestinal cancer, aged 47 (3) Bleeding from rectal adenomata at 15 years, perineo abdominal excision for multiple carcinoma of rectum associated with adenomatosis at age of 38 (three separate malignant growths—see fig 3), alive and well 1¼ years later

FAMILY VI

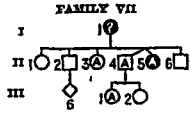


I—(2) Colostomy for malignant disease at 37 years, died 3 weeks later (4) Death from hepatic metastases

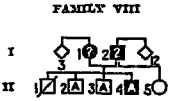
II—(1) Death from "abdominal" cancer, aged 50 (2) Death from cancer of intestine, aged 45 (4) Death from cancer of rectum, aged 53 (6) Death from cancer of rectum, aged 53 (7) Perineo-abdominal excision for cancer of rectum associated with adenomatosis, aged 53, alive and well 1½ years later (fig 2)

III—(1) Cancer of intestine, aged 23, treated with radium

FAMILY VII



FAMILY VIII



FAMILY VII—I—(1) Death from cancer of colon, age unknown

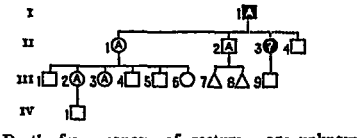
II—(3) Died aged 40, known to have suffered from adenomatosis (4) Symptoms of adenomatosis, aged 30, colectomy aged 41, died after operation, no sign of carcinoma (5) Twin sister of II (4), symptoms of adenomatosis developed at same age as twin brother, died, aged 41, from intestinal cancer

III—(1) Adenomata found at 14 years, now aged 17 and under treatment

FAMILY VIII—I—(1) Death from intestinal cancer, aged 41 (2) Death from cancer of colon, aged 50

II—(2) Multiple adenomata found at 24 years now aged 31 and under medical supervision (3) Colectomy for adenomatosis, aged 24, died after operation, no sign of carcinoma (4) Adenomatosis and inoperable cancer of rectum found at 21 years, died aged 22

FAMILY IX

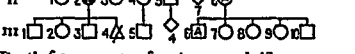


I—(1) Death from cancer of rectum, age unknown

II—(1) Symptoms of adenomatosis at 21 years, patient now aged 50, no sign of carcinoma but has had several adenomata removed by local excision during last 7 years (2) Suffers from adenomatosis, now aged 49 (3) Death from carcinoma of colon, aged 32

III—(2) Symptoms of adenomatosis at 14 years, now aged 29 (3) Symptoms of adenomatosis at 8 years, now aged 27

FAMILY X



I—(1) Death from cancer of rectum, aged 42

II—(2) Colostomy for inoperable intestinal cancer, died 3 years later (6) Symptoms of adenomatosis at about 30 years, perineo-abdominal excision for adenomatosis at age of 37, no sign of malignancy (fig 1)

III—(6) Symptoms of adenomatosis at 17 years, now 18

EXPLANATION OF GENEALOGICAL TABLES

A Ⓐ	Male or female with adenomatosis
? ?	Male or female with cancer but not examined for adenomatosis
A Ⓐ	Male or female with cancer and adenomatosis
⊠ ⌀	Death in male or female offspring under 7 years
△	Sex unknown
⏃	Death in infancy, sex unknown
?	Siblings (brothers and sisters) not individually represented Number (if known) is indicated below, otherwise a note of interrogation is used

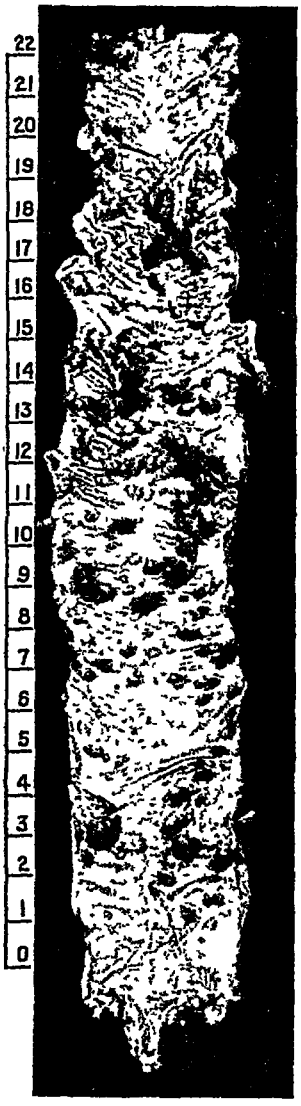


FIG. 1—Rectum and colon showing widespread adenomatosis (family X, II (6))

FIG 2—Carcinoma (indicated by arrow) associated with adenomatosis (family VI, II (7))

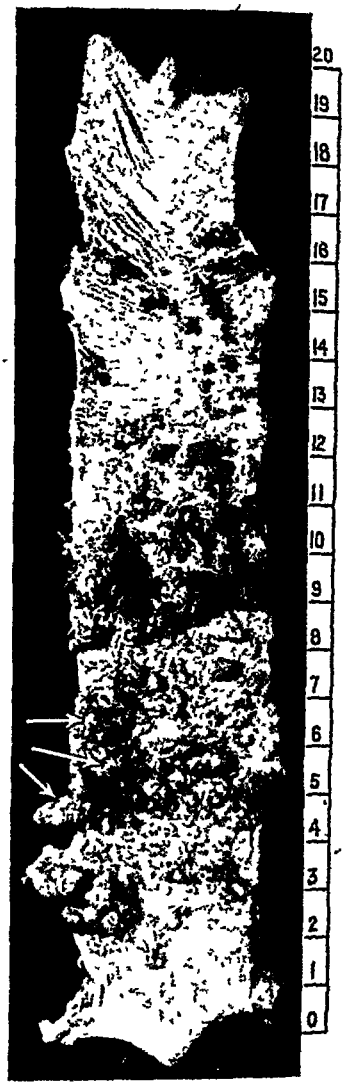


FIG 3—Multiple carcinoma (indicated by arrows) associated with adenomatosis (family V, III (3))

be present Among the general population it is rare for cancer of the rectum or the colon to develop before 40–50, but in families affected by adenomatosis it often begins to develop at 30–40 or even earlier. The age of death from cancer in adenomatosis families is also younger by about twenty years than the average age of death from this disease in the general population In these families the average age of death from cancer of the intestine was 42 The youngest was 22 and the oldest 60 In only a few cases were we able to collect reliable information about the exact age at which cancer began, but it was generally in the early thirties Although there may be considerable variation in different families, as a general rule in families affected by adenomatosis the tumours begin to develop about 20, malignant changes may be expected about fifteen years later, and untreated cases die from cancer in the early forties

It is obvious from the genealogical tables that the disease may be transmitted by either sex Since in most cases only one parent was affected, we have omitted from the tables the unaffected partner in the marriage In two cases, however, we have evidence that both husband and wife died of cancer (families II and VIII), and in both of these families most of the

FIG 4—Section through rectal mucosa in a case of adenomatosis (× 8)

descendants developed adenomata at an early age Family VII is also of special interest because of the presence of twins (generation II, 4 and 5) Symptoms of adenomatosis developed in both twins about 30 One was treated by colectomy at 41, but he succumbed to the operation His twin sister died of intestinal cancer also at 41

FIG 5—Section through rectal adenoma in a case of adenomatosis (× 10)

The appearance of the mucosa of the colon and rectum in adenomatosis is shown in figs 1, 2, and 3, and the histology of the adenomata in figs 4 and 5 The onset of malignancy can generally be detected by changes in the colour and consistence of the adenomata Tumours with active epithelial proliferation are always darker than quiescent growths, but, when cancer develops the growth becomes dark red or dark brown and much firmer than the surrounding adenomata It is common to find evidence of malignant degeneration in two or three different regions

The familial character of adenomatosis is obvious not only from these charts but also from the other cases reported by Dukes (1930) Most observers of this disease have concluded that the defect is inherited as a Mendelian dominant The disease is not congenital in the ordinary sense of the word, since it does not manifest itself for several years, but it is certainly due to an inherited defect, and the most likely explanation seems to be that it is caused by a gene mutation Evidence is steadily accumulating for the view expressed by one of us (Lockhart Mummery 1934) that tumours are the result of a genetic change in a normal growing somatic cell This explanation is applicable also to adenomatosis, in which disease the genetic defect appears to be a tendency to a more rapid growth of the intestinal mucosa, leading first to hyperplasia and later to adenomata This defect may be explained as a result of a gene mutation and the liability to it is handed on from one generation to the next The more rapid growth of the intestinal mucosa increases the probability of a further gene mutation responsible for malignancy, a change which can only take place when cells are undergoing mitosis Because of the more rapid growth of the intestinal epithelium there must be a greater frequency of mitotic division and this again increases the probability of a further gene mutation which manifests itself as cancer In a rapidly growing adenoma the chance of this happening is much greater than in normal mucosa where mitosis only takes place at comparatively rare intervals

Our explanation suggests therefore that familial adenomatosis is the result of an inherited instability of the epithelial cells of the large bowel which renders their nuclei peculiarly liable to undergo mutation for excessive rate of growth We regard the increased incidence of cancer of the colon and rectum as a secondary phenomenon dependent on the fact that mitotic division is more frequent in proliferating adenomata than in normal mucosa

The treatment of adenomatosis presents a difficult problem Constant medical supervision is necessary so that a radical excision may be undertaken as soon as malignancy is detected One patient in this series was treated by deep X rays to the whole large bowel It was doubtful if any real improvement resulted, and the progress of the disease was certainly not arrested Five cases were treated by complete excision of the colon, and four of these patients are alive and well This formidable operation may be indicated in some cases but is not necessary for all

We express our gratitude to all our colleagues at St Mark's Hospital who allowed us to consult the notes of their cases, to the doctors to whom we have written for further details of cases, and most of all to patients and relations who have cooperated by submitting to examinations and providing information. Much of the clerical work has been carried out by Miss S H Douglas, receiving a temporary grant from the British Empire Cancer Campaign, to whom we also express our obligations

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BACTERIÆMIA FOLLOWING TONSILLECTOMY

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DURING the last ten years at least six attempts have been made to determine the frequency with which bacteriæmia follows tonsillectomy (Rubin, Epstein, and Werner 1929, Schwartz and Frisch 1929, Bartlett and Pratt 1931, Wirth 1932, Fischer and Gottdenker 1936, Southworth and Flake 1938) My excuse for adding to them is the lack of agreement in the recorded observations The discrepancies, which range from a failure to demonstrate a single positive blood culture (Rubin et al 1929) to a 32 per cent positive rate (Fischer and Gottdenker 1936), may result from variations in the technique of blood culture and from differences in the time after operation at which a sample of blood was taken

TECHNIQUE OF BLOOD CULTURE

In the present investigation a technique has been used similar to that adopted in a previous inquiry into bacteriæmia following dental extractions, when many positive blood cultures were obtained within a few minutes of operation (Okell and Elliott 1935, Elliott 1938) This procedure allows of comparison between the relative frequencies of immediate blood-stream infection following these two types of operation, and it seems reasonable to assume that what proved to be the best moment for taking a sample of blood after dental extraction would be the best moment for taking it after tonsillectomy

Samples of 4–10 c.cm of blood were withdrawn from an arm vein immediately before and within five minutes after tonsillectomy Both specimens were taken while the patient was under the influence of a general anæsthetic—ether or gas and oxygen In a few instances a third sample of blood was taken a little later

Each sample of blood was divided into two or three equal parts, and these were inoculated into 20 c.cm. quantities of sodium citrate, Liquoid* (a synthetic polymer of sodium anethol sulphonate), citrate saponin, or saponin-liquoid broth. In the early part of the investigation citrate and saponin-citrate broth were used exclusively, but subsequently the citrate broth was replaced by liquoid and saponin-liquoid broth. The final concentration of sodium citrate, saponin, and liquoid in the blood-broth mixtures lay between 0·17 and 0·18 per cent., 0·042 and 0·017 per cent., and 0·017 and 0·019 per cent. respectively. The blood broths were incubated aerobically at 37° C. for seven days, after which subcultures were made on to 5 per cent. horse-blood agar and into 0·1 per cent. glucose broth; these subcultures were incubated for two days at 37° C.

In thirty-five subjects "pour-plates" also were made and incubated at 37° C. aerobically for seven days to obtain a count of the viable organisms if the culture proved positive. This procedure was subsequently discontinued, for, even when the blood-culture was positive, bacteria could never be demonstrated in numbers greater than 1 per c.cm. of blood.

BLOOD-CULTURES AFTER TONSILLECTOMY

Table I summarises the results of blood-culture immediately after tonsillectomy. In 14 cases an

TABLE I—BACTERIÆMIA FOLLOWING TONSILLECTOMY IN 100 CASES

Operative technique	Cases examined	Result of blood-culture after operation	Nature and incidence of bacteriæmia						
			Str. viridans	*Str. pneumoniæ*	Hæmolytic streptococcus	Hæmophilus	Staphylococcus	Corynebacterium	Bacillus (aerobic spore-bearing bacteria)
Blunt guillotine	67	25+ (37%)							
Dissection	33	13+ (39%)							
Total ..	100	38+	12	2	7	6	5	4	2

+ Indicates that bacteria were isolated from the blood-cultures

additional sample of blood was taken for culture one to three hours after operation. *Staphylococcus albus* was isolated from 1 of these samples, which had been taken two hours after tonsillectomy; the blood taken for culture both before and immediately after operation was sterile. The remaining 13 samples were sterile, although positive blood-cultures had been obtained in 4 of these subjects immediately after operation. It appears, therefore, that the bacteriæmia following tonsillectomy is of short duration, as is the case after dental extraction. The organisms recovered in the 38 positive cases shown in table I were:—

Streptococcus (21).—These were classified in the first instance according to the appearance produced by surface colonies on 5 per cent. horse-blood agar. Hæmolytic streptococci were further identified by slide agglutination with type-specific antisera kindly supplied by Dr. F. Griffith. The following types were isolated in pure culture: type III, type IV (twice), type XII, and type XIII. On two further occasions hæmolytic streptococci were recovered which were not agglutinated by any of the type-specific antisera, although 1 of these cultures yielded an extract which gave a precipitate when tested with a group A (Lancefield) antiserum. The remaining "untypable" hæmolytic streptococcus did not correspond to group A, B, or C. Serological matches for the streptococci from the blood were found in cultures taken from the appropriate tonsils after removal in 4 of the 6 cases in which *Str. pyogenes* was isolated from the blood-cultures. In only 1 instance was there a failure to recover hæmolytic streptococci from the tonsil when such bacteria had been found in the blood after operation.

Of the non-hæmolytic streptococci, 2 cultures were bile-soluble and corresponded culturally and morphologically to *Str. pneumoniæ*. One belonged to type III but was not pathogenic for a mouse in a dose of 0·5 c.cm. of an eighteen-hour broth culture. The other did not correspond to type I, II, or III. The remaining non-hæmolytic streptococci were of the *Str. viridans* type.

Hæmophilus (6).—These organisms were identified by their morphological and cultural characters on simple nutrient agar, 5 per cent. horse-blood agar, and Fildes's agar. None grew unaided on simple nutrient agar, although 2 out of 4 cultures tested grew symbiotically with *Staph. albus* on this medium and apparently belonged to the "parahæmophilus" group. All the hæmophilic organisms isolated exhibited satellitism with *Staph. albus* on horse-blood agar, but none were hæmolytic.

Staphylococcus (5).—Of these organisms 3 were of the *albus*, 1 of the *aureus*, and 1 of the *citreus* type. None were hæmolytic for horse blood.

Corynebacterium (4).—All showed characteristic morphological and cultural characters on Loffler's medium. Two fermented glucose and sucrose, 2 fermented neither of these carbohydrates.

Bacillus (2).—The 2 aerobic spore-bearing organisms isolated from the blood were not investigated in detail.

The isolation of staphylococci, diphtheroids, and spore-bearing aerobic bacilli, organisms commonly found on the surface of the skin, is possibly to be ascribed, in some cases, to contamination.

PYREXIA FOLLOWING TONSILLECTOMY

In most of the patients who underwent tonsillectomy during the morning the temperature rose to 99°–100° F. by the evening but had fallen again to the pre-operative level twenty-four hours later. The occurrence and degree of pyrexia was not found to bear any obvious relationship to the existence of a demonstrable bacteriæmia or to the presence of any particular kind of organism in the blood-stream after operation. The blood was not examined for bacteria during the pyrexial period, but a similar rise in temperature had been observed in patients after dental extractions, when samples of blood taken at this time—i.e., four to nine hours after operation—had always proved to be sterile.

BLOOD-CULTURES BEFORE TONSILLECTOMY

In 64 out of the 100 cases in which the blood was examined after operation a sample of blood was taken for culture immediately before tonsillectomy. A similar sample was taken before operation in 18 cases from which no blood could be obtained after tonsillectomy. Of these 82 blood-cultures before operation 7 (8·5 per cent.) were positive, *Str. viridans* being recovered twice, *Staph. albus*, *Sarcina lutea*, *Bacillus subtilis*, a diphtheroid, and a mould once each. In 3 of these 7 cases a positive blood culture was also obtained immediately after operation, but the organism isolated from the second was always different from that recovered from the first sample, except once when *Str. viridans* was obtained from the blood taken both before and after tonsillectomy. Apart from this case, it seems probable that the

* Liquoid is the proprietary name given to this compound by its manufacturers, Roche Products Ltd.

isolation of bacteria from the blood taken before operation was due to contamination, for the same organisms were not found in the postoperative sample, whereas those isolated from the preoperative specimen were types commonly found on the surface of the skin

Comparison of different blood culture media.—Each sample of blood was distributed equally between sodium citrate, saponin citrate, liquoid, or saponin liquoid broth, and the results are shown in table II. Two samples of blood are omitted from consideration in table II, for they were inoculated only into saponin citrate broth, both cultures were positive. There was no evidence for the enhanced growth of any particular type of organism by any particular type of broth medium, except possibly saponin citrate broth from which hæmolytic streptococci were recovered 5 times as compared with 1 occasion on which they were recovered from liquoid broth in 5 blood cultures when both media were used in parallel.

TABLE II.—ISOLATION OF BACTERIA FROM DIFFERENT BLOOD CULTURE MEDIA USED IN PARALLEL

Samples of blood—		Growth in—			
Cultured	Containing bacteria which grew on culture	Citrate broth	Saponin citrate broth	Liquoid broth	Saponin liquoid broth
52	7	4 times	4 times	Not used	Not used
36	8	Not used	5 „	4 times	„
100	20		14 „	12 „	15 times

CULTURES FROM TONSILS

In 137 cases cultures were made on 5 per cent horse blood agar from the surface and crypts of the tonsils after their removal. A sterile platinum loop was roughly passed over the surface and introduced into the crypts of each tonsil and then rubbed over the surface of a blood agar plate. Hæmolytic streptococci were isolated from 87 cases (64 per cent.), being present in profuse culture in 54. From 44 unselected cases in which the tonsillar cultures yielded a growth of hæmolytic streptococci an attempt was made to identify these organisms by the slide agglutination method. In 18 cases (86 per cent.) the streptococci corresponded to serological types found in group A (Lancefield), in 1 case to a type in group C, and in 1 to a type in group G. Of the remaining 4 cultures of hæmolytic streptococci 1 belonged to group A but could not be typed with certainty, and 3 cultures could not be typed and were not grouped (see table III).

TABLE III.—HÆMOLYTIC STREPTOCOCCI ISOLATED FROM TONSILS IN 44 CASES

Type (Griffith)	Recovered from tonsils in—	Type (Griffith)	Recovered in tonsils in—	Type (Griffith)	Recovered from tonsils in—	Type (Griffith)	Recovered from tonsils in—
I	Cases 3	VI	Cases 2	XIV	Cases 1	XXII	Cases 1
II	2	XI	1	XV	1	XXV	1
III	4	XII	2	XVI	1	XXVIII	4
IV	3	XIII	4	XX	1	Ut	4

Ut = untyped

DISCUSSION

A fair body of evidence has now accumulated pointing to the conclusion that transient bacterial invasion of the blood stream is a not infrequent occurrence usually unattended by serious consequences. This had appeared evident from the results of animal experiments and observations summarised by Haines (1937). Nocard drew attention to the fact that the serum of fasting horses was nearly always sterile whereas that of animals recently fed often contained bacteria. Desoubry and Porcher (1895) confirmed this in the case of dogs, and Griffith (1907), using a different technique, obtained similar results with calves and pigs. Fatigue and starvation are also factors which, in experimental animals, appear to facilitate the passage of organisms from the alimentary tract into the blood stream (Ficker 1905, Boycott and Price-Jones 1926, Cobbett and Graham Smith's unpublished observations). In man a condition of "subinfection" was postulated by Adami (1910), who contended that under normal conditions bacteria are carried in the blood stream and lymphatics from the intestine to the liver and mesenteric lymph nodes. In conditions of "chronic intestinal irritation," he said, that the normally occurring bacteriæmia is increased and the bacteria are visible as "abundant minute granules" in the liver cells and mesenteric glands. Lewis and Grant (1923) have brought forward evidence of a different nature suggesting an "almost physiological entry" of organisms into the blood stream of the average person.

Tissue injury in infected areas has long been established as the cause of transient bacterial invasions of the blood stream. The observations of Seifert (1925) on a large series of cases subjected to operation, re examination of wounds, or the changing of dressings in an infected area clearly demonstrated this. Similar evidence was brought forward by Burrington and Wright (1930), who made blood cultures from patients in whom there had been some manipulation in an infected urinary tract, and Lehmann (1926) recovered *Cl. welchii* from blood cultures made immediately after curettage in 18 out of 100 consecutive abortions. Operations in an area so heavily infected as the mouth would be expected to lead to bacterial showers in the blood stream, and these have been demonstrated in many patients immediately after the extraction of teeth, especially in the presence of severe gingival infection (Okell and Elliott 1935, Fish and Maclean 1936, Round Kirkpatrick, and Hails 1936, Southworth and Blake 1938, and Bulleid's unpublished observations). Furthermore, it has been shown that a minimal degree of tissue damage, such as is produced by the slight manipulation of a tooth in an infected socket (Elliott 1939) or by the chewing of hard sweets by a patient with infected gums (Round et al. 1936), will induce immediate though transient invasion of the blood stream, nearly always by streptococci of the *viridans* type. From these observations it seems fair to conclude that an almost constant "seepage" of organisms into the blood stream takes place from heavily infected tissue, such as the gums, which, in pyorrhœa are constantly submitted to mild degrees of trauma similar to that caused by the movement of a loose tooth in an infected socket.

It is not surprising, therefore to find that tonsillectomy is followed in a fair proportion of cases by a demonstrable bacteriæmia. The incidence of bacteriæmia after removal of tonsils appears to be about the same as after extraction of teeth in a "clean"

mouth (34 per cent) but considerably less than after extraction of teeth in pyorrhœa (76 per cent) On the other hand, the diversity of bacteria in the blood seems to be greater after tonsillectomy than after dental extraction, when non-hæmolytic streptococci are found almost exclusively. This may be correlated with the great variety of the bacterial flora of the tonsil as compared with that of the gums, where *Str. viridans* is almost always the predominating organism.

From time to time cases are recorded in which subacute bacterial endocarditis appears to follow tonsillectomy; instances have also been described of recrudescence of acute rheumatism or of acute nephritis after this operation. The foregoing observations indicate a possible source and mode of infection in such cases It is of interest that occasionally the causal organism in subacute infective endocarditis is of the hæmophilus or parahæmophilus group (Miles and Gray 1938), and that those organisms may be found in the blood after tonsillectomy. Of equal interest is the observation that pathogenic organisms such as *Str. pyogenes* may circulate in the blood for short periods and in small numbers without producing any observable ill effect.

The results of the tonsillar cultures here recorded suggest that some 60 per cent. of patients admitted to hospital for tonsillectomy carry *Str pyogenes* in the throat. This is not altogether surprising, for it must be borne in mind that most of these patients had diseased tonsils, although it was not customary to admit cases for tonsillectomy within six weeks of an attack of tonsillitis These observations are, therefore, not comparable with those of Hare (1935), who found *Str pyogenes* in 7 per cent. of throat and nose swabs taken from normal subjects A carrier-rate of about 60 per cent , however, among patients admitted to hospital for tonsillectomy emphasises the risk in otorhinological wards of streptococcal cross-infection, which a previous inquiry has indicated as happening not infrequently in the absence of special preventive measures (Okell and Elliott 1936)

SUMMARY

(1) A transient bacteriæmia has been observed in 38 out of 100 patients within a few minutes of tonsillectomy. (2) Bacteria were found in the blood regardless of whether the tonsils were removed by blunt guillotine or dissection. (3) The organisms isolated included *Str pyogenes*, *Str. viridans*, *Str. pneumoniæ*, *Hæmophilus influenzæ*, staphylococcus, and corynebacterium (4) Serological matches for *Str. pyogenes* recovered from the blood were isolated from the corresponding tonsils after their removal. (5) Hæmolytic streptococci were recovered from the tonsils of 87 out of 137 patients undergoing tonsillectomy (64 per cent) (6) Of 44 cultures of streptococci so isolated and examined serologically 39 (86 per cent) belonged to group A, 1 to group B, and 1 to group C (Lancefield). (7) The evidence for the common occurrence of transient bacteriæmias in man and animals and the possible bearing of these observations on the ætiology of subacute infective endocarditis are briefly discussed.

The preparation of this paper owed much to encouragement and advice from the late Prof C. C. Okell. My thanks are due to Mr. Alfred Walford, hon. surgeon to Addenbrooke's Hospital, Cambridge, for access to cases under his care, and to Dr. F. Griffith, of the Ministry of Health, for the use of type-specific streptococcal antisera. The work was carried out during the tenure of a grant from the Harmsworth Memorial Fund.

References at foot of next column

PRODUCTION AND PREVENTION OF CARDIAC MURAL THROMBOSIS IN DOGS

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IN a previous communication (Solandt and Best 1938) the use of heparin in the prevention of experimental coronary thrombosis in dogs was described. It was recognised that, owing to the indefinite nature of the premonitory signs of coronary thrombosis in man, this procedure would have limited value as a means of preventing the thrombosis However, if administered after the thrombosis had occurred it would presumably inhibit the extension of the thrombus and it might prevent the formation of cardiac mural thrombi. As over 10 per cent. of the deaths from coronary thrombosis are caused by embolic sequelæ to mural thrombus formation, this latter possibility seemed worthy of investigation

The first objective of the present experiments was therefore to obtain, with absolute certainty, mural thrombus formation on a necrotic area. The second was to prevent such thrombus formation with heparin.

METHODS

Dogs weighing 5–15 kg. were used as the experimental animals. The tip of the left ventricle was chosen as a region of the heart favourable for the formation of large thrombi It is a site from which the blood-stream will have no great tendency to dislodge a thrombus, especially if the myocardium at the tip is rendered inactive

In previous studies on coronary occlusion it was found that simply tying the coronary vessels supplying the tip of the left ventricle did not, in over 100

DR ELLIOTT: REFERENCES

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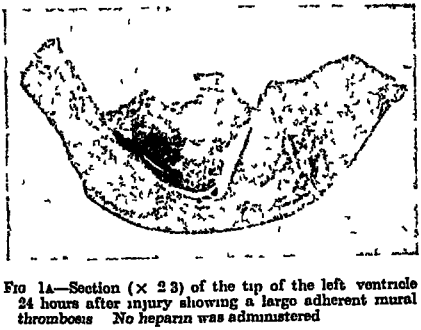

FIG 1A—Section (× 2 3) of the tip of the left ventricle 24 hours after injury showing a large adherent mural thrombosis No heparin was administered

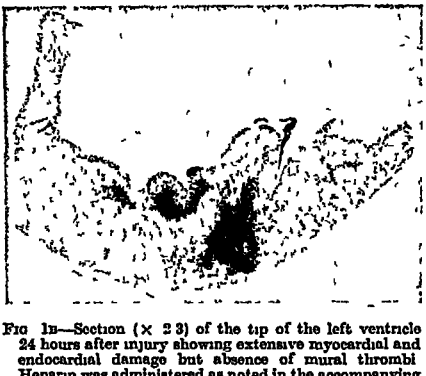

FIG 1B—Section (× 2 3) of the tip of the left ventricle 24 hours after injury showing extensive myocardial and endocardial damage but absence of mural thrombi Heparin was administered as noted in the accompanying table

animals, result in the formation of a macroscopic or microscopic mural thrombus The technique finally evolved to bring about thrombus production was to tie the descending branch of the left coronary artery and then infiltrate the myocardium at the tip with 2 c cm of 5 per cent sodium ricinoleate (Soricin) This solution was introduced through a fine (No 32) hypodermic needle and an attempt was made to deposit the solution in the muscle immediately adjacent to the endocardium About eight 0 25 c cm injections, covering an area 1–2 cm in diameter, were usually made On a number of occasions less drastic injury gave thrombus formation, but certainty of formation rather than minimal injury was our objective It seems reasonable to suppose that, once agglutinating platelets have covered an injured region, the nature or degree of the underlying tissue damage will have little or nothing to do with subsequent growth of the thrombus Thrombus formation may well be an all or-nothing process

Routine electrocardiograms were taken, using the chest lead (left arm lead over the apex-beat at the

TABLE I—MURAL THROMBUS EXPERIMENTS (1½ HR CONTROL SERIES)

No heparin administered and animals autopsied 1½ hr after hearts injected

Dog no	Ecg R wave (in)	Thrombus (a) macroscopic, (b) microscopic	Dog no	Ecg R wave (in)	Thrombus (a) macroscopic, (b) microscopic
1-26	—	(a) Large mural thrombus (mixed and white) and clot (b) large thrombus (mixed and white)	6-45	—	(a) Large mural thrombus (mixed and white) and clot (b) large thrombus (mixed and white)
2-30	—		7-46	—	
3-33	—		8-48	—	
4-34	3/32		9-49	—	
5-43	—		10-50	—	

Ecg = electrocardiogram

TABLE II—MURAL THROMBUS EXPERIMENTS (1½ HR HEPARIN SERIES)

Heparin administered—70 units per kg given 3–5 min before soricin injection and second similar dose approximately ½ hr later except in no 45 where only initial dose given Animals autopsied 1½ hr after hearts injected

Dog no	Ecg R wave (in)	Thrombus (a) macroscopic (b) microscopic	Dog no	Ecg R wave (in)	Thrombus (a) macroscopic (b) microscopic
1-29	1/8	(a) No mural thrombus or clot (b) Small white thrombi	4-35	1/16	(a) No mural thrombus or clot (b) no thrombus
			5-37	1 16	
2-31	—	(a) As above (b) no thrombus	6-38	—	
			7-39	—	
3-32	—	(a) As above (b) small white thrombi	8-40	1/2	
			9-41	1/16	
			10-44	—	

TABLE III—MURAL THROMBUS EXPERIMENTS (24 HR CONTROL SERIES)

No heparin administered and animals autopsied approximately 24 hr after hearts injected

Dog no	Ecg R wave (in)	Thrombus (a) macroscopic (b) microscopic	Dog no	Ecg R wave (in)	Thrombus (a) macroscopic (b) microscopic
1-12	—	(a) Large mural thrombus (mixed and white) and clot, (b) large thrombus (mixed and white)	6-17	—	(a) Medium mural thrombus (mixed and white) and clot (b) large thrombus (mixed and white)
			7-18	—	
2-13	—	(a) Medium as above, (b) as above	8-20	—	(a) Large as above (b) as above
3-14	—		9-21	—	
4-15	—		10-22	1/32	
5-16	—	(a) Large as above (b) as above			

TABLE IV—MURAL THROMBUS EXPERIMENTS (24 HR HEPARIN SERIES)

Heparin administered—70 units per kg given 3–5 min before soricin injection and second similar dose approximately ½ hr later (no second dose in nos 66 and 67) Continuous intravenous of heparin at the rate of 40 u /kg /hr started during this ½ hr interval and continued until autopsy Animals autopsied approximately 24 hr after hearts injected

Dog no	Ecg R wave	Shortest clotting time observed	Thrombus (a) macroscopic (b) microscopic
1-51	—	1½ hr	(a) No mural thrombus or clot (b) no thrombus
2-52	—	1½ hr	
3-54	—	Over 5 hr (no early sample)	
4-55	—	1½ hr	
5-61	Not done	Over 3½ hr (no early sample)	
6-64	"	16 min	
7-65	"	12 min	
8-67	"	14 min	

5th–7th rib and right-arm lead over the costo-vertebral angle) previously investigated (Solandt and Best 1938). The resulting records furnished information on the site and degree of the myocardial damage.

RESULTS

Fig. 1A shows a mural thrombus formed in the left ventricle of a heart treated in the manner outlined above. Large pendulous thrombi were usually found 30 minutes after the injection of the sclerosing solution. Such thrombi were composed chiefly of platelets.

The results obtained from a series of animals on which the autopsies were performed 1½ hr. after the hearts were injected are summarised in table I. Macroscopic mural thrombi were present in every case.

It is worthy of note that, in the dog, any damage which prevents the contraction of the apical region

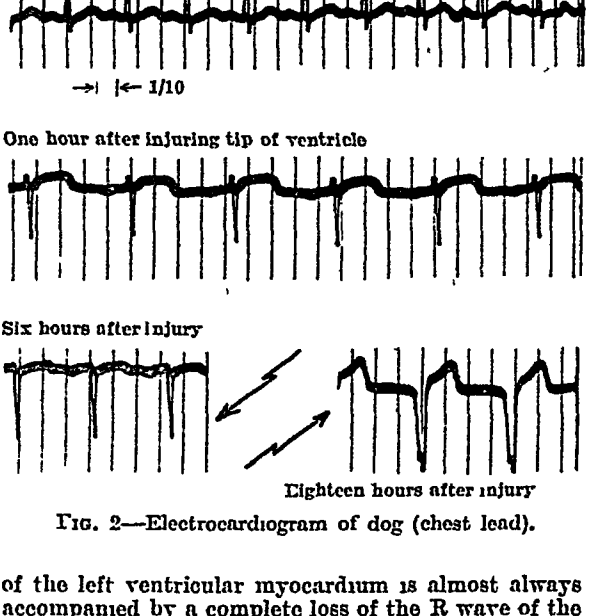

FIG. 2—Electrocardiogram of dog (chest lead).

of the left ventricular myocardium is almost always accompanied by a complete loss of the R wave of the electrocardiogram with the particular chest lead used. Fig. 2 shows the sequence of changes which culminate in this striking end-result. This confirms our previous observations (Solandt and Best 1938).

The results obtained on a series of animals treated as those in table I, except that heparin was administered as noted, are summarised in table II. A sterile and non-toxic solution containing 1000 units of heparin per c.cm., as supplied by the Connaught laboratories of the University of Toronto, was used in all our studies. No macroscopic thrombi were seen although microscopic clumps of platelets were present in many cases. The significance of this microscopic clumping will be discussed.

The results obtained from a series of animals on which the autopsies were performed 24 hours after the hearts were injected are summarised in table III. Again macroscopic mural thrombi were present in every case. A similar series which received heparin is described in table IV. Fig. 1B shows the tip of the left ventricle of the heart of an animal from this latter series. The damaged myocardium, necrotic endocardium and absence of mural thrombi are all very evident. No macroscopic or microscopic mural thrombi were found in this series.

DISCUSSION

It seems apparent from the foregoing results that, in the dog, heparin will prevent the formation of mural thrombi over grossly damaged endocardium. The damage produced was probably, in every case, much more severe than is ever seen in man as a result of occlusion of one or more coronary vessels. It seems reasonable to suppose, therefore, that heparin would prevent mural thrombus formation following a coronary thrombosis.

In the present experiments necrosis and thrombus formation started almost as soon as the sclerosing chemical was brought into contact with the myocardium. After coronary thrombosis it is probable that several days must elapse before necrosis becomes sufficiently severe to induce mural thrombus formation. Thus, in coronary thrombosis, one would expect to prevent the formation of a mural thrombus even if the administration of heparin was started some considerable time after the initial thrombosis. Just how long the heparin must be continued to permit a degree of healing such that further thrombosis will not occur when the heparin is discontinued is a matter which can be settled only by clinical trial. Murray, Jaques, Perrett and Best (1937) have shown that complete healing of the grossly damaged intimal layer of a vein takes place during heparin administration. It is reasonable to infer that the endocardium might undergo similar repair when thrombus formation over the injured area is prevented. To prove this point, however, a great many dogs would have to be sacrificed, since in animals which have undergone extensive operative procedures it is extremely difficult to prevent hæmorrhage from the cut surfaces when heparin is used.

A few of the hearts from the 1½ hr. heparin series showed microscopic clumps of platelets. These were never seen in the 24 hr. heparin series. In other experiments, not yet reported, we have evidence that the action of heparin on the agglutination of platelets takes longer to develop than does the effect on blood-clotting. In the 1½ hr. series the microscopic clumping of platelets could probably have been prevented by allowing a longer interval to elapse between the initial dose of heparin and the injection of the sclerosing solution. The clumps of platelets similar to those seen in this 1½ hr. series were probably also present early in the 24 hr. series. It is probable that they were washed away and were not replaced after the action of heparin on platelet agglutination had become fully established.

It has been suggested (*Brit. med. J.* 1938, Graybiel and White 1939) that heparin is contra-indicated in the prevention of coronary thrombosis where the initial vascular damage consists of a subintimal hæmorrhage as described by Paterson (1938) and Wartman (1938). Obviously this objection does not apply to the use of heparin in the prevention of formation of mural thrombi. In this case, as previously mentioned, the blood-clotting time need not be raised until some time after the thrombosis of the artery is complete; heparin has no effect on a thrombus already formed. However, we would like to take this opportunity to point out that the administration of heparin early in an attack of coronary thrombosis, even before the actual vascular thrombosis, is not necessarily contra-indicated in the light of the evidence at present available. It is not established that bleeding into a tissue space, such as the subintimal site mentioned, is stopped by blood-clotting. This

hæmorrhage is more probably checked by tissue pressure before clotting takes place, and the administration of heparin under such conditions should in no way extend or prolong the bleeding Obviously, however, this point can only be settled when extended clinical trials with heparin have been made We would like again to emphasise the fact that this objection to the use of heparin, even if valid, in no way involves its application in the prevention of mural thrombus formation

SUMMARY

1 A method is described by which cardiac mural thrombi may be produced in animals These thrombi form very rapidly

2 This formation of mural thrombi may be completely prevented by the administration of adequate amounts of highly purified heparin

3 Since over 10 per cent of the deaths associated with coronary thrombosis in man are caused by embolic sequels of mural thrombus formation, a clinical trial of heparin is indicated It would be useful to discover, by clinical investigation, the duration of heparin administration necessary to permit endocardial healing sufficient to ensure freedom from subsequent thrombus formation

It is a pleasure to thank Dr D L MacLean for the histological work involved in these experiments The technical assistance of Mr C R Cowan has been invaluable

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MONOCYTIC ANGINA

(GLANDULAR FEVER) TREATED WITH M & B 693

REPORT OF A CASE AND EXPERIMENTAL TRANSMISSION

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THE history of the recognition of glandular fever and of the several clinical types to which this virus infection may give rise, together with the symptomatology and blood picture of the disease have been very clearly described by Letheby Tidy He mentions three types (1) glandular, (2) anginose, and (3) febrile (which might also be called the exanthematous type), and points out that cases of mixed type may occur

The case reported below belongs to the second group and is an example of the anginose type in pure form These cases are comparatively rare and may give rise to considerable difficulty in diagnosis in their earlier stages

CASE RECORD

The patient was a girl, aged 18 with little in her past history of interest, except that she had always disliked sun glare and was said to have suffered on two or three occasions from 'a touch of sun," the symptoms having been headache and nausea, accompanied by fever lasting a few days

On May 15, 1939, she went from London to stay in Paris During the last few days of that month she found the heat and bright sunlight rather trying, and she felt unduly tired On June 1 she felt definitely unwell and complained of headache and slight nausea. It was remarked that she looked ill She consulted a doctor in Paris, who diagnosed *un coup de soleil* She returned to London on June 3, her symptoms then consisting of fairly severe headache, an intense dislike of daylight, obstinate constipation, and feverishness

The patient first came under observation on June 7, the seventh day of her illness She lay in a completely darkened room and complained of intense headache but had no true photophobia, she was irritable and rather resentful of examination, the temperature was 102° F, pulse-rate 108, and respiration-rate 22 The face appeared rather puffy, especially about the eyes, the cheeks were flushed and the conjunctivæ slightly suffused The tongue was moist and but thinly coated The bowels had been opened the previous day with senna Detailed examination did not elicit any other signs Fundi oculorum normal, no signs referable to the central nervous system, the respiratory and cardiovascular systems were normal, the throat appeared healthy, there was no glandular enlargement or any evidence of enlargement of the liver or spleen, the kidneys were not palpable, nor was any departure from normal detected elsewhere in the abdomen, the urine contained no abnormal constituents

On June 9 serum reactions for *Bacillus typhosus* "H" and "O," *Bacillus paratyphosus* A "H," *Bacillus paratyphosus* B "H" and "O," and *Brucella abortus* proved negative A rapid examination of a blood-smear revealed nothing of interest

Between the 7th and the 12th, in spite of the continued pyrexia, the patient appeared remarkably well, the tongue remained almost clean, the headache was less severe, and the dislike of the light had passed, no fresh signs or symptoms had appeared. On the 12th a mildly irritable cough developed, and on the following day complaint was made of soreness of the throat and stuffiness of the nose, the fauces appeared red on examination

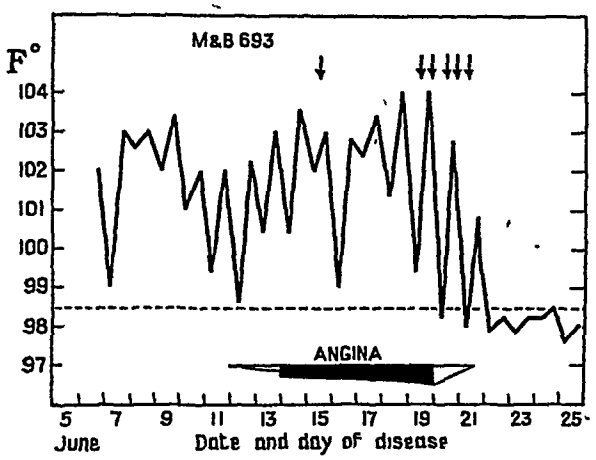
By June 14 (the fourteenth day of the disease) a rapid change had occurred, there was obvious swelling of the left side of the neck, and there was much œdema in the region of the left tonsil, which itself was much swollen, acutely inflamed, and covered by a diphtheritic-like membrane The tonsillar lymphatic gland was much swollen and tender, swallowing almost impossible, nourishment refused, and rest greatly interfered with, the patient showed some degree of anxiety The tongue was now thickly coated and the breath foul Cultures and smears from the throat showed the presence of the pneumococcus, *Staphylococcus aureus*, *Micrococcus catarrhalis*, and spirochætes of the Vincent type The temperature had reached over 103° F, but still the patient appeared comparatively well

Further laboratory investigations carried out by Dr H Schwabacher proved the blood and urine to be sterile on culture Serum reactions as above were repeated and again proved negative The following morning the local condition in the throat was worse, and the spleen was palpable This completed the clinical picture of the anginose type of glandular fever, confirmed by the report on blood examination received the following day red blood-cells 4,600,000, hæmoglobin 91 per cent, colour index 0·9; halometer reading normal, white cells 16,200 polymorphs 30 per cent, with a slight shift to the left, monocytes 66 per cent The Wassermann reaction was negative

Further confirmation of the diagnosis was made on the 17th, when the Paul Bunnell reaction (blood taken on the 14th) was returned as positive, lysis occurred in 1 in 640 dilution

Treatment.—At midday on the 15th an attempt was made to give M. & B 693 by mouth, but the vomiting resulting from the administration of one tablet (0·5 g.) was so severe that administration of the drug had to be discontinued Four days later, on the 19th, when the temperature had reached 104° F, and the condition of the patient was at its

worst, a second attempt was made, on this occasion by intramuscular injection. At 4 P.M. 0 5 g. of M. & B 693 in oily emulsion was given into the buttock and at 10 P.M. 1 g. of the water-soluble sodium preparation into the other buttock The temperature fell from 104° to 98° F. The following day (20th) the temperature rose to 102 8° F. in the evening; on that day two injections of the soluble salt, each of 1 g, were given into the gluteal muscles, at 12 noon and 9.30 P.M. The temperature fell to



Temperature chart At the first arrow the drug was given by mouth and at the following arrows intramuscularly.

98° F. On the 21st a fifth injection was given at 10.30 A.M. The temperature that afternoon only reached 100 8° F, to fall again on the morning of the 22nd and remain normal thereafter (see chart).

Very soon after the first injection cough became more pronounced, and a good deal of foul sputum, consisting of the products of disintegration of the tonsillar exudate, was coughed up. In a bout of coughing during the second injection at 10 P.M. and again on the evening of the next day the sputum was freely bloodstained. After the lapse of three days from the beginning of treatment the faucial condition had practically cleared up, and the patient could once more take nourishment freely and slept peacefully the night through, the first time for three weeks.

DISCUSSION

This case illustrates very well the clinical course of a case of glandular fever of the anginose type in uncomplicated form: a prodromal period of ten days (seven to fourteen) with headache and progressively rising temperature, obstinate constipation, but no other signs, and relatively mild constitutional disturbance followed by the complaint of sore-throat and then the extremely rapid development of an acute membranous angina with faucial œdema and swelling of the neck towards the end of the third week, splenic enlargement but no exanthem and no enlargement of superficial lymphatic glands or signs of involvement of the mediastinal or mesenteric glands. This forms a characteristic and diagnostic syndrome, the blood formula is pathognomonic, and the Paul-Bunnell test depending on the development of heterophil antibodies in the patient's serum may now be relied on as proof of the infection.

As far as we are aware, this is the first case of monocytic angina to be treated with M. & B. 693 Obviously it would be unwise to argue from a single observation, but the rapidity and the manner of the apparent response to treatment are very suggestive of a specific action of the drug in this infection The mode of fall of the temperature and the rapid resolution of the angina (which untreated may persist for a very much longer time), together with the rapid establishment of convalescence, were most striking On the other hand, the action of the drug may have been solely upon secondary organisms.

EXPERIMENTAL TRANSMISSION

Blood removed on the nineteenth day of illness was cultured aerobically and anaerobically on the more commonly employed bacteriological media and yielded no growth The culture medium, rich in serum, used for the isolation of pleuropneumonia like organisms also showed no growth

In recent years evidence has been accumulating that infectious mononucleosis is due to a filtrable organism

Bland (1931a and b) injected blood, taken during the febrile stage of infectious mononucleosis, into rabbits and produced a fatal infection. Heart blood, obtained from the rabbits, injected into rhesus monkeys caused fever, general lymphadenitis, enlargement of the liver and spleen, and a mononucleosis with primitive lymphocytes. Although Bland's experiments were complicated by the presence of *a toxoplasma, he certainly succeeded in causing in* monkeys a syndrome similar to that seen in human beings.

Later, van den Bergh and Liessens (1939) and Wising (1939) produced an infection in the rhesus monkey. Van den Bergh and Liessens injected a rhesus monkey intramuscularly with blood taken on the fourth day of illness. For the first three weeks the differential leucocyte-count showed little change, the percentage of large mononuclears being between 0 5 and 2 5. On the twenty-fourth day the large mononuclears were 13 5 per cent., on the twenty-fifth day 21·5 per cent, and on the twenty-sixth day 12 per cent. There was no febrile reaction and no definite enlargement of the lymph-nodes. The infection could be passaged in series, and the infective agent was filtrable through a Seitz pad. Wising (1939) also reported an increase in the number of mononuclear cells, together with adenitis and slight fever. During the course of the experiments a laboratory assistant was accidentally contaminated with blood from an infected monkey and after about seven days developed symptoms highly suggestive of infectious mononucleosis.

In the present investigation 4 c cm of whole blood from the patient was injected intramuscularly into a rhesus monkey. *Daily differential blood-counts* were made. The number of large mononuclear leucocytes varied from 1 5 to 4 per cent. for the first twelve days after injection Then on the thirteenth day after infection the number rose to 7 per cent. and on the fifteenth day to 28 per cent, falling on the sixteenth day to 12 per cent and remaining between 15 and 20 per cent till the twenty-first day after inoculation Blood-cultures taken from the monkey at the height of the mononuclear leucocytosis remained sterile The monkey at no time showed a temperature reaching 104° F., although the lymph-nodes in the axilla were a little more easily palpable during the period of reaction.

Blood from the patient, inoculated intracerebrally into mice, caused no evidence of illness, and no toxoplasmata were seen in smears from their tissues

Confirmatory evidence has thus been obtained that infectious mononucleosis is transmissible to the rhesus monkey Further observations are being made, especially on the action of chemotherapeutic drugs

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CLINICAL NOTES

TREATMENT OF SPRAINS BY INJECTION OF PROCAINE

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A SPRAIN is defined as a temporary subluxation in which the articular surfaces have returned to their normal positions and in which some damage has been done to the ligaments tendons or muscles around the joint The ligaments are most commonly affected This structure may be completely torn across or it may be avulsed from its attachment, when an extravasation of blood into the surrounding tissues can be observed, or in less severe injuries there may only be a partial tearing or stretching of the ligament, soon followed by œdematous swelling of the damaged tissues

The injury is always accompanied by intense pain, which may be localised to the site of the lesion or spread to involve the neighbouring parts According to Prof René Leriche an anatomically slight injury to the very sensitive nerve endings in the neighbourhood of joints starts a reflex, which begins with centripetal impulses from joint to central nervous system A vasomotor response follows, with local œdema and rise of temperature, pain and limitation of movement The disturbance of the local vasomotor equilibrium gives rise to continued impulses and a vicious circle is thus established

The treatment of sprains used to be most unsatisfactory Once fracture was excluded by radiography the treatment in hospital practice was usually left to the nurse or dresser who applied a tight bandage to the joint over some lint soaked in some cooling lotion, or the joint was strapped with adhesive bandage The rest of the treatment was left to the physiotherapy and massage department Though sprains are only minor injuries they may give rise to prolonged discomfort and invalidism and the average sprain in an adult, treated in this way, requires 2–4 weeks to heal

The recent treatment of sprains by injection of procaine into the injured ligaments is, as far as can be judged at this stage, a definite advance on the old treatment The centripetal impulses are cut off and abolished by the action of the local anæsthetic Thus the local vasomotor response is diminished or prevented altogether and somehow does not appear to reoccur to any marked extent even after the action of procaine has worn off Future work must show whether this theory is really in accordance with physiological facts

Technique—The ligaments of joints that are most commonly sprained are easily accessible The skin over the sprain is carefully cleaned with methylated ether It is now a matter of palpation to find for injection the most tender point This is marked and the injection made through it down to the ligament The strength of the solution of procaine is 2 per cent and 3 to 5 c cm are usually sufficient for a minor and 5–10 c cm for a more severe sprain The fluid is injected in various directions Thus the whole affected area is infiltrated After injection the part is lightly massaged, thus distributing the procaine evenly throughout the tissues With sterilised instruments and solution there is no risk of sepsis and an accidental intravenous injection can be avoided by the usual precautions Injection may have to be repeated on the second or third day if the result after the first injection should not be satisfactory

A total of 20 cases of sprains has been treated, the patients' ages ranging from 11 to 65 They were allocated as follows radial collateral, 2, dorsal radiocarpal 3, volar radiocarpal, 1, ulnar collateral, 1, anterior talofibular, 8, calcaneofibular, 3, tibial collateral, 1, dorsal first metatarsophalangeal, 1 The average amount of procaine injected varied between 3 and 10 c cm Pain disappeared at once in 15 cases and was much relieved in 5 cases It did not return in 7 cases, recurring after one hour in 1 case, after 2 hours in 1 case, after three hours in 3 cases, after four hours in 1 case, after five hours in 1 case, and after six hours in 6 cases In only 2 cases was it necessary to give a second injection after twenty four hours

The effect of this treatment is dramatic All the signs and symptoms of a severe sprain may disappear in a few moments after procaine has been injected into the ligament of the joint involved If, for example, a sprain of the ankle is promptly treated, œdema, local heat, pain, tenderness and almost complete loss of function will quickly vanish and the patient will be able to walk home It is of advantage to inject the sprained part soon after the injury occurs, but also old sprains have been successfully treated in this way Pain usually returns 3–6 hours after injection It varies in intensity, and is usually less than the initial pain, though a few patients complained of more severe pain It then gradually passes off and completely disappears after 24–48 hours A slight ache and feeling of weakness in the joint may be noticed for 1–4 days after the accident After injection the joint is firmly strapped with Elastoplast and the patient instructed to use the limb carefully Exercise is better avoided for several days so that the patient may regain his sense of security and also to prevent a recurrence of the sprain This treatment has been successfully employed for sprains of the ankle and wrist joints, which are the sprains most commonly encountered Sprains of the knee joint and the smaller joints of the hand and foot have equally benefited by it and the results have generally been good and quite uniform with regard to recurrence of pain and final cure

SKIN GRAFTS IN THE CASUALTY DEPARTMENT

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EVERY surgeon who has had charge of a hospital casualty department will remember patients brought to the hospital as a result of some accident in which an area of skin and fat had been lost, and will also remember that these patients had to tolerate painful dressings for many weeks before the wounds healed by granulation This note is to suggest a method by which both the pain and the waste of time can be avoided and a much better cosmetic result be produced than by allowing healing to take place by granulation

The cutting of a thin Thiersch graft and its application to the raw area will produce a healed wound after five days with no infection and no scarring, provided that the wound is not grossly infected when first seen, in which case it must of course be treated on the usual lines There are many wounds however which, although they are not technically

sterile, are quite clean enough to allow perfect healing of a graft applied to a raw area To advocate the grafting of a raw surface is, of course, to suggest nothing new, but I believe that to emphasise the simplicity of the procedure under local anæsthesia together with the fact that the patient is treated entirely as an outpatient will draw attention to a method of treatment which is sadly neglected.

The technique is simple and the rules are few, but *it is important to realise* that they must be obeyed with meticulous care if success is to be obtained The wound must be grafted as soon as it is seen and not allowed to wait until it becomes infected Any temporary dressing, with which it may be necessary to cover the wound during the journey to hospital must consist only of sterile gauze soaked in saline, and under no circumstances must chemical antiseptics be used

Forearm of a child, showing two healed areas on which a Thiersch graft had been applied five days before

The figure shows two areas on the volar aspect of a child's forearm soundly healed five days after the application of a Thiersch graft to a wound caused by broken glass The patient attended hospital a few hours after the injury and was grafted at once, the outer side of the right thigh was sterilised with spirit and an area large enough to cover the defect was blocked by the subcutaneous injection of 2 per cent procaine It is important to put the procaine under the skin and not into it, since intradermal injection makes the cutting of a graft almost impossible The area should then be rubbed in order to spread the local anæsthetic evenly under the skin, and about five minutes allowed for it to take effect, after which the graft may be cut with any skin knife Until a little experience has been gained in the "feel" of the skin after the injection of local anæsthetic the surgeon tends to cut a graft which is thin and ragged, so that it is as well to hold the knife as though a thick graft were required, when it will be found that the blade does not sink through the skin but merely cuts an epithelial layer of average thickness

The graft is fixed by marginal sutures to the raw area and both the donor and recipient areas are covered with a greasy Vaseline dressing (Tulle Gras is the best) backed up by swabs soaked in normal saline, the whole being firmly held in position by elastic plaster bandages It is as well to immobilise the grafted area, and in the case here illustrated this was effected by a plaster slab and a sling, but it is quite unnecessary to rest the leg and the patient is able to walk home without experiencing any pain. The dressings must be left untouched for five days, after which they are removed, when it is found that the donor area (leg) is quite healed and that the grafted area needs only the removal of the marginal sutures and the renewal of the greasy dressing for a further week

As is always the case, this patient experienced no pain in the raw area as soon as it had been covered with the graft, and the injury was at once reduced to a mere inconvenience, in that the patient had to rest her arm in a sling for a week. I have used this method for a wound on the dorsum of the foot when the patient walked out of hospital as soon as the graft had been fixed in position, and have found a perfect graft when the dressing was removed five days later, in spite of the fact that there must have been some slight movement of the two surfaces when walking A final recommendation for this method of treatment is the excellence of the cosmetic result, which is much better than can ever be obtained by allowing granulation to take place The graft requires about three months in which to take on the colour and texture of the surrounding skin, after which it will be found to be hardly visible

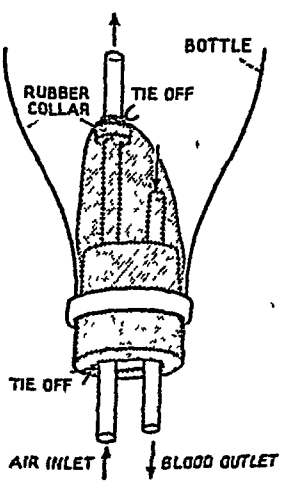
A NEW FILTER FOR BLOOD-TRANSFUSION

By MONTAGUE MAIZELS, M.D. Lond., M R C.P.
CLINICAL PATHOLOGIST, UNIVERSITY COLLEGE HOSPITAL, LONDON

When blood has been kept for a few days after collection, it is usual to filter it through glass wool or McCartney beads before transfusion. In my view glass wool is unsatisfactory. It is unpleasant material to work with, for it is liable to scarify the skin and to fragment easily, so that technicians preparing hundreds of such filters a day would be wise to wear gloves and a mask Packing the wool in the filter bulb requires considerable skill; if too loose or too tight, it is worse than useless The glass-wool filter is not easy to clean, especially if left for some time after use, and the removal of old glass wool and its replacement by fresh is a fiuicking procedure. The filter is efficient for blood which is fresh or only two or three days old, but it is liable to clog with tacky gelatinous material when used for blood that has been standing for a longer time

On the other hand gas-mantle fabric (before impregnation with incandescent salts and collodion) provides an efficient filter which may be used as an alternative to the glass beads or to replace the glass-wool filter.

The untreated gas-mantle of commerce consists of a knitted cotton tube with a purse-string tie-off at each end. It may be used as a filter in three ways —



(1) A common method of transfusion is to collect blood in a bottle containing sodium-citrate solution, and to fit the vessel with a rubber bung pierced by a long air-inlet tube and a short blood-outflow tube. The bottle is inverted and the blood is led into the vein of the recipient through a rubber tube and needle

To fit the mantle-filter a collar of narrow-bore rubber pressure-tubing is placed over the long air-inlet tube which it grips tightly. The mantle is drawn over the bung and its tubes and one of its purse-strings is tied above the pressure tube collar The purse-string at the other end of the mantle is drawn tight under the bung around the emergent glass tubes. The outfit may now be autoclaved.

The bung is then rammed into the neck of the bottle (see figure)

(2) If the mantle is shorter its lower purse string may be drawn tight over the upper end of the bung

(3) Another common method of administering blood is to pour it into a cylindrical funnel filtering it through a few layers of gauze awkwardly stuffed into the mouth of the funnel It is simpler to place a large mantle inside the funnel, turn the upper edge of the mantle over the upper rim of the funnel, and tie off the purse string just below the rim so as to hold the mantle in place

For method (1), mantles should be 3 in long by 1½ in wide (flat), for method (2), 1½ in by 1½ in, and for method (3) 8 in long by 3 in wide. They may be obtained from William Still and Sons, 29 Greville Street, E C 1, for a few pence

MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SECTION OF SURGERY

With Prof J R Learmonth (Aberdeen) in the chair, this section discussed

Treatment of Intractable Pain

Mr Norman Dott (Edinburgh) said pain was an indefinable term It was the reaction to a stimulus, but the strength of the reaction did not indicate the nature or severity of the stimulus It was the experience of bodily harm, and had its own anatomical pathway through the lateral nucleus of the optic thalamus Pain had two elements, affective and cognitive The affective element consisted of distress and fear and was experienced in the cerebral nuclei The cognitive element consisted of appreciation of localisation, temperature and area of contact, these were experienced in the cerebral cortex Pain was largely a protective physiological mechanism for example against overdistension of viscera but there were severe pains, such as headache and the pain of malignant disease, which were noxious without physiological reason These were the intractable pains Here the cause was either unknown or could not be removed In persistent pain, the thalamic centre which tended to prevent impulses reaching the cortex became exhausted The pain was produced in two ways First an abnormal stimulus itself caused the pain, as in the contraction of scar tissue, and the involvement of nerve endings in malignant disease Secondly, an innocent stimulus, such as touch or heat, might be perverted or augmented to feel like severe pain This was usually an axon reflex as in causalgia Occasionally a central lesion augmented or deranged stimuli, the most frequent cause was gliosis following trauma, disseminated sclerosis syringomyelia, or tumour Patients with these conditions were all susceptible to barometric changes Augmentation depended on four factors (*a*) *perversion*, when other forms of sensation such as cold or touch were perverted into the pain pathway, (*b*) *undue radiation*, when leakage of impulses occurred at the synapses, (*c*) *hypersensitivity*, when the inhibitory mechanism of the cortico thalamic region was out of action, and (*d*) *epileptiform facilitation* of the pain conducting system, paroxysmal or intermittent with only slight cause

Pain was sometimes conditioned by the individual, and there was evidence to believe in psychogenic pain Some viruses passed up along nerves and even across synapses as in herpes zoster, leading to permanent damage with trophic and vasomotor changes Trigeminal neuralgia was sometimes caused by inflammatory processes spreading from the accessory air sinuses Pain was localised to the side of the lesion only as far as the thalamus It was sometimes possible to infer the lesion from the type of pain felt In central types, it was advisable to assess the pain after peripheral impulses had been blocked by local or spinal anæsthesia If these relieved the pain, the treatment was obvious In post-herpetic neuralgia, blocking of the gasserian ganglion relieved the hyperæsthesia and paroxysmal pain, but often left a dull central ache Treatment of intractable pain was palliative Pain impulses were blocked either above the causative lesion, or below the lesion, when the pain was relieved by abolishing the facilitating stimuli

Mr T F Todd (Manchester) described his experience in 82 cases of intractable pain, mostly caused by carcinoma of the cervix He considered pain was intractable when natural sleep was impossible Visceral pain was relieved by presacral neurectomy, and somatic pain by intrathecal injection of absolute alcohol Intrathecal injection was quite safe if one knew the technique It was important to inject the alcohol slowly and limit the injection to not more than 1 c cm Occasionally it was followed by incontinence or retention, but this mattered less since all the cases treated were suffering from advanced malignant disease In several cases the posterior columns had been examined and found to show degenerative changes following injection The procedure was not recommended except for inoperable malignant disease

Mr J B Oldham (Liverpool) discussed pain of renal origin It was a relatively common complaint, and renal sympathectomy showed no untoward effects Intractable renal pain was probably due to spasmodic contraction of the smooth sphincteric muscle in the calyces and pelvis of the kidney, and there was possibly a vasospastic element Renal sympathectomy produced a kidney which was insensitive to distension, and frequently the size of the renal pelvis decreased He often combined the procedure with a plastic operation on the renal pelvis or nephropexy Afterwards there was a secretion of larger quantities of more dilute urine Pyelography was painless for about a year subsequent to the operation

Mr G F Rowntree (Manchester) spoke on the treatment of trigeminal neuralgia The operations available were avulsion or injection into the three main branches of the nerve, alcohol injections into the second and third divisions intracranial neurectomy of the three divisions root-section in the middle cranial fossa approached extradurally, section by intradural approach through the posterior fossa and lastly, intramedullary tractotomy Section or block in front of the ganglion gave good results but was sometimes followed by recurrence of pain after two years Root section was precise in its localisation, and anæsthesia of the cornea could be avoided In the extradural approach any facial paralysis was caused by damage of the greater superficial petrosal nerve and was transient Approach through the posterior fossa was sometimes technically difficult Tractotomy did not leave the face anæsthetic, but it

was a hazardous procedure and its only indication was in bilateral disease when keratitis had commenced in the other eye. As an anæsthetic he preferred basal narcosis combined with gas and oxygen. Probably the extradural fractional root-section through the middle fossa was the operation of choice.

Mr. D. W. C. NORTHFIELD (London) asked whether keratitis was more common following injection than operation and Mr. ROWBOTHAM replied that in his experience keratitis occurred sometimes after all the procedures he had described, but he thought that it was more common after injection.

Prof. LAMBERT ROGERS (Cardiff) suggested that keratitis was less common if thyroid extract were administered following the operation. Dr. GERALD SLOT (London) thought that much of the pain in trigeminal neuralgia was of sympathetic origin. He had used paravertebral injections of novocain with effect and had used A.B.A. for injections of the trigeminal ganglion. Dr. P. W. R. PETRIE (Loanhead) spoke of the psychogenic causes of headache. Mr. NORMAN LAKE (London) discussed philosophy of pain. There was no complete explanation of pain, nor why trivial lesions might cause severe pain when more serious damage was sometimes symptomless. There were some pains which did not appear to have any physiological use. Some races were more sensitive to pain than others. He thought that at least part of this was early education to know and fear pain.

Dr. W. McK. CRAIG (Mayo Clinic) also spoke on psychogenic pain. He hoped that someone would discover a method of measuring the intensity of pain so that it would be possible to estimate the relation between psychogenic and organic pain before an operation had to be considered.

Mr. C. F. MAYNE (Plymouth) asked if any nerve section had been found to alleviate the severe pain in carcinoma of the pancreas. Prof. C. F. W. ILLINGWORTH (Glasgow) said that the pain in carcinoma of pancreas was readily explainable in terms of the numerous retroperitoneal nerves in that area. He quoted a case of pancreatic cyst where pain was completely relieved by the removal of the cyst.

Mr. NORMAN DOTT, summing up, agreed that pain could not be assessed scientifically. Loss of sleep was not enough. He had placed great reliance on the patient's own story. He did not think keratitis was more common after one type of operation than the other. Psychogenic pain did not enter into his scheme of life at all. He thought that visceral pain was largely protective. He himself had found it to be protective against the evil effects of Aberdonian hospitality.

Arteriovenous Fistula

Mr. A. M. RENNIE (Aberdeen), introduced by Mr. Norman Lake, described four cases of congenital arteriovenous fistula. It was due to abnormal patency of embryonic channels between arteries and veins. Normally a few of these channels persisted and aided in the temperature regulating mechanism of the limbs. Often they gave no symptoms until adolescence, but might be shown up by trauma. The fistulæ tended to be multiple. They produced nutritional changes in affected part, and cardiac changes similar to those of aortic incompetence. In all the cases he had seen the arteriovenous communication was in the lower limb, which was considerably hypertrophied and longer than the healthy limb. Section of an affected saphenous vein revealed that the vein wall had become arterialised. The venous blood on the affected side was found to be highly oxygenated, and the temperature was several degrees higher than on the healthy side. No proper explanation had been given for the hypertrophy of the limb. Owing to the possible dangers, arteriography had not been attempted. Treatment was unsatisfactory because of the multiplicity of communications. Ligature and injection had been used, amputation, though a last resort, was frequently followed by great relief of the cardiac symptoms.

Mr. NORMAN LAKE suggested that uroselectan might be used to outline the vessels, and Prof. LEARMONTH said that injection into an artery was an extremely painful procedure and to get a good picture it would have to be carried out rapidly.

Water Balance

Mr. D. C. L. BINGHAM (Edinburgh) said that, in giving water and saline an adequate volume of fluid must be administered daily, and dehydration must be prevented or corrected. In normal metabolism, about 800 to 1500 c.cm. of water was lost through the skin. This was frequently greatly increased in disease. The urine was normally about 1000 to 1500 c.cm. Therefore the body required between 2500 and 3500 c.cm. of fluid daily in health. It had been found convenient to give a patient 2500 c.cm. of fluid during the first twenty-four hours after operation, by intravenous infusion with 5 per cent. glucose in distilled water, and to measure the amount of urine passed. If the urine was less than 1000 c.cm., more fluid was needed.

He recommended the preoperative administration of 1000 c.cm. of physiological saline before operations on the gastrointestinal tract. All abnormal fluid losses, such as from biliary or intestinal fistulæ, should be made good.

SECTION OF MEDICINE

AT a meeting of this section, with Dr. A. GREIG ANDERSON (Aberdeen), the president, in the chair, a discussion on

Prophylatic Immunisation

against diphtheria, whooping-cough, measles, scarlet fever and influenza was opened by Sir JOHN LEDINGHAM (London). He said that of these diseases diphtheria clearly merits chief consideration; first, because of the great toll it takes of child life, and secondly, because it has been demonstrated beyond question, though so far in countries other than this, that active immunisation intelligently and persistently carried out has actually brought the morbidity from diphtheria in certain localities down to zero. These methods depend for their success far more on propaganda directed towards securing the immunisation of all pre-school children than on the particular immunising substance employed. He urged that the fact that experience of the performance of these antigens both in the laboratory and in the field has not yet resulted in complete unanimity as to the best possible type of antigen and the ideal method of administering it should not be allowed to hold up schemes for applying our present knowledge in practice.

The investigation of an antigen for prophylactic purposes comprises a study not only of its potency, tolerability and the like when administered in a single dose but also of the effect of multiple doses suitably spaced. Many elaborate studies of these antigens, in particular of formol-toxoid (F.T.), alum-precipitated toxoid (A.P.T.) and toxoid-antitoxin floccules (T.A.F.) are, he said, on record, and an analysis of the data seems to suggest that either three injections of F.T. and T.A.F., or two injections of A.P.T., at intervals of at least a month, would greatly reduce the

incidence of diphtheria amongst the immunised Probably three doses of A P T would be the most effective of all, or one dose of A.P T followed by two of F T or T A F That the dose interval, and particularly the interval between the first and second doses, should be long rather than short, is a well-established finding in immunisation practice, whether in man, horse or guinea-pig He emphasised that while the immunisation of school children must be the first instalment of effort the ultimate objective should be the immunisation of the maximum number of children between the ages of 9 months and 2 years When such immunised children enter school a reinforcing dose seems desirable He said that suggestions likely to render immunisation against diphtheria more generally acceptable to parents and others responsible for the conservation of child life will be welcome, but he himself considered that some form of compulsion is the only remedy

Sir John Ledingham pointed out that in England and Wales whooping cough was responsible in 1937 for a death rate of 0 04 per 1000, as against 0 07 for diphtheria, while the corresponding rates for measles and scarlet fever were 0 02 and 0 009 Influenza with its death rate of 0 45 much exceeded these and, although the prospects of influencing its morbidity and mortality by prophylactic measures are not at the moment very hopeful, he felt sure that efforts to explore still further the possibilities of active immunisation will continue Immunisation against whooping cough certainly demands further exploitation and here again we have to turn to other countries and especially the United States of America for relevant data The results of some recent efforts strongly support the view that vaccines prepared from smooth organisms can confer a considerable degree of protection against pertussis In this country combined studies by public health officers and bacteriologists are much to be desired The gradual enlightenment of the public, by repeated demonstrations in its midst, of the benefits that immunisation could confer on children exposed to diphtheria and whooping cough would greatly facilitate progress We might envisage the immunisation of children with a mixed vaccine of smooth pertussis organisms and diphtheria toxoid, in the light of Ramon's demonstration that the addition of T A B vaccine to his diphtheria "anatoxine" in no way militates against the efficiency of either element

Dr D W Berry (Aberdeen) reviewed the present position of the prophylaxis of scarlet fever The usual method consists of the injection of diluted toxin subcutaneously five times at weekly intervals and in increasing doses The total dosage he said, should not be less than 20 000 skin test doses, and many prefer to give a total of 80,000 to 100 000 skin test doses Many parents refuse to have their children immunised in this way because of the frequent injections Reactions are more common than in the case of diphtheria immunisation and they sometimes take the form of "miniature scarlet fever" They can generally be avoided by making the initial injection a small one and increasing the dose gradually Dr Berry stated that there is no evidence that anti bacterial immunity resulted, the effects appear to be only antitoxic He suggested that this method of prophylaxis should still be used in those exposed to infection, and passive immunity with scarlet fever antitoxic serum reserved for use in children very badly exposed

Dr William Gunn (London) dealt with prophylactic immunisation against measles He stated that convalescent serum has given good results but that this is difficult to obtain in sufficient amounts when it is most needed At the beginning of an epidemic the demand is large, but a plentiful supply does not become available until the epidemic is subsiding He described a method whereby serum can be dried and then reconstituted when required The potency of serum treated in this way seems to be maintained for a long period Normal adult serum has been found to be about one third as potent as convalescent serum, but it is reasonably effective in modifying attacks Dr Gunn has found that immune globulin extracted from human placentas is not much more effective than adult serum and he has largely abandoned its use because of the reactions which sometimes follow He referred to the occurrence of severe toxic hepatitis with jaundice in some cases which had been treated with one batch of serum No satisfactory explanation has been arrived at, but a living virus may have gained access to that particular batch

Dr C H Stuart-Harris (London) said that the isolation of a virus from human cases of epidemic influenza raised hopes that some form of immunisation would be effective The virus can be isolated from most cases in large epidemics, but in small localised epidemics such isolation frequently fails There is a tendency for influenza of the virus positive type to be associated with a heavy mortality from pneumonia Dr Stuart Harris then described immunisation experiments in humans given injections of formolised virus Two years ago many people were treated in this way, but the epidemic of influenza broke out a month earlier than was expected and this invalidated the results Recently, a series of boys on the naval training ship at Shotley were given three subcutaneous injections at two weekly intervals The results were not encouraging, and it may well prove that formolised virus is inactive The possibility of using live virus for prophylactic purposes should be considered

Dr H J Parish (Beckenham) expressed his dissatisfaction with the status of prophylactic measures against diphtheria in this country and pleaded for their more widespread use In discussing the relative merits of the various immunising preparations available, he said that F T (formol toxoid) is apt to give undesirable reactions and is less efficient than A P T (alum precipitated toxoid) and T A F (toxoid-antitoxin floccules) A P T is the most potent antigen but it sometimes produces reactions in older children and in adults in whom T A F might therefore be substituted The latter should certainly be used if there is sensitivity to a detector dose of A.P T T A F contains a little serum and accordingly sometimes causes serum sickness, but the frequency of this occurrence has now been reduced by the use of refined serum which has been concentrated by proteolytic enzymes and so has a lower protein content For high grade immunisation the interval between injections is of more importance than the size of the dose Four weeks should elapse between the first and second injections, but if three injections are given the interval between the second and third need not exceed two weeks Dr Parish believes that the Schick test is of great value in assessing the efficacy of immunisation, but it has the defect of individual variation and a zone of partial immunity separates positive and negative reactions He said that it may be necessary to give periodic injections of T A F or A P T in order to achieve permanent immunity—e g a child may be immunised when he first goes to school and again when 9 years old The Schick test may be omitted if it becomes customary to give reinoculations in this way

SECTION OF PATHOLOGY AND BACTERIOLOGY

Prof. JOHN CRUICKSHANK (Aberdeen) presided over this section, and a discussion on

Non-infective Enlargement of the Lymph-nodes

was opened by Dr JOAN ROSS (London). She described the architecture of the lymph-gland and the character of the cells forming it. According to Maximow a supporting stroma is present in all lymphoid tissue. This stroma consists of a framework of reticulin fibrils, closely connected with which is undifferentiated syncytium. The syncytium is mesenchymal in origin and has the capacity of multiple differentiation. When stimulated the reticular syncytium may give rise to reticulum cells. Specially differentiated reticulum cells called "littoral cells" are found in the various sinuses of the spleen, bone-marrow and liver. There is therefore a common or stem-cell type which when given the appropriate stimulus can differentiate along various lines. In the normal adult the stimulus for the development of the myelocyte is in the bone-marrow and for the lymphocyte in the lymphadenoid tissue. In disease the stimulus may act in an abnormal situation or the stimulus itself may be abnormal. The derivatives of the syncytium, reticulum-cells, lymphocytes of all sizes and histiocytes lie in the meshes. At the edge of the sinuses reticulin fibrils are condensed and some of them cross the lumen of the sinuses and continue into the capsule. These fibres support the littoral cells. The follicles contain few reticulin fibrils, the reticular syncytium forming a supporting stroma for all types of lymphocytes. She thought there is probably a specificity of action by unknown agents on sinus, medulla and follicles causing a hyperplasia of the reticular tissue.

Dr. Ross then went on to illustrate and classify the reticulosis which she defined as a progressive hyperplasia of reticular tissue with differentiation to one or more cell-types. It can be systematised throughout the body or free cellular elements may be present in the blood as in the leukæmias. The three large groups are the medullary, follicular and sinus reticuloses. In medullary reticulosis there are undifferentiated mesenchyme cells in the medullary tissue or in the pulp of lymph-nodes or of the spleen and liver, and possibly in the connective tissues of the body. It may be primary, in which case free cellular elements may appear in the blood, and either hæmic as in the leukæmias, or histiocytic or fibromyeloid as in lymphadenoma. The other group of medullary reticuloses is the metabolic, such as Gaucher's disease and Niemann-Pick disease. In follicular reticulosis there is a hyperplasia of undifferentiated cells in the lymph-follicles and malpighian bodies of the spleen and production of follicular structure in bone-marrow. The types are lymphoid, lymphoid and histiocytic, and giant-cell and fibrillary. In sinus reticulosis there is a hyperplasia of littoral cells in the lymph-sinuses and in the various sinuses of the spleen and bone-marrow. Tissue histiocytes may also be involved.

Dr. A. H. T. ROBB-SMITH (Oxford) dealt with the reticulosarcomata, which include the lymphosarcomas and Ewing's tumour of bone. These are, he said, proliferations of mesenchymal cells or their progeny which result in stromal destruction as well as infiltration. The destruction is best recognised in such organs as the kidney and thyroid. In many cases the reticulosarcomata shows evidence of true embolic metastasis. Little is known of the frequency of these tumours but evidence from the Dutch East Indies suggests that they are more common in native peoples. Of 450 examples of primary lymphadenopathy which he and Dr. Bodley Scott examined 12 per cent. were reticulosarcomas. The greatest incidence is usually between the ages of 50 and 60, but a few arise in young adults. Anatomically there are three groups of reticulosarcomas. The first are those with a primary lesion in an area of lymphoreticular tissue with secondary involvement of the regional lymph-nodes and subsequent metastasis to distant organs by the blood-stream; this is common in the pharyngeal lymphoid ring, the small intestine and the bone-marrow. Secondly, there are reticulosarcomas arising from a pre-existing reticulosis such as lymphoid leukosis or lymphadenoma proper. This association has been emphasised by many writers but Dr. Robb-Smith does not believe that the proportion of patients with reticulosis showing malignant change is any higher than in neuro fibromatosis. The third group are those showing a generalised reticulosarcomatosis analogous to the classical lymphosarcomatosis of Kerndrat. Apart from the second group abnormal cells in the circulating blood are rare.

Dr. Robb-Smith said he had adopted a cytological classification of these tumours similar to that of Gery and Bablet. Showing photomicrographs of the various types he remarked that there are many undifferentiated forms, all the cases described as arising from littoral cells he regards as examples of secondary carcinoma in lymph sinuses. From a clinical point of view it is difficult to give a satisfactory picture because the tumours are protean in character and may arise anywhere in the body. Generally the growth is rapid and painless and interference with function is the first symptom. The lymph-nodes are soft and become moulded into a solid mass. The inguinal nodes are commonly the first to be involved—an unusual position in early Hodgkin's disease; and furthermore the patient is often over 45. There is no doubt that irradiation is the treatment of choice except for tumours of the intestine and bone-marrow where excision followed by irradiation is best. The survival of all cases averages about two years, but some patients are well even after seven years. The speaker concluded by appealing for a centralisation of information about the primary lymphadenopathies, on the lines of the American bone sarcoma registry. Only in this way, he believes, can adequate knowledge be got about the prognosis and best method of treatment for an individual patient.

Dr. W. B. DAVIS (Blackpool) spoke of the experimental aspects of Hodgkin's disease. Among 230 Gordon's tests there were 8 false results, it is important to remember that spasticity and ataxia are the criteria of the positive test-rabbit and that salivation and fits are due to cerebral trauma and not to any agent in the gland. Speaking of his alternative to the Gordon test, which he called "a Friedman test," Dr. Davis said that in his hands it has been considerably more accurate. It has the advantages of being applicable to post-mortem material and to pus. He emphasised that the test does not replace but is only complementary to histological examination. To the criticism that a positive result may be given by normal tissues such as eosinophils he answered that he has obtained a positive Friedman in tissues which had no such cells. There is a possibility of certain reticulum cells playing a part in the reaction and in any case the

test is a biological means of distinguishing a particular type of cell

Dr C E VAN ROOYEN (Edinburgh) agreed on the greater delicacy of the Friedman test He does not now believe in the virus theory of Hodgkin's disease, but thought it would be unwise to bang the door on this explanation till more is known of viruses The disease appears to be neoplastic, since transmission has been impossible Reticulum cells, or certain of them, probably contain the active agent When he exposed Gordon's agent to X-radiation he found it was not inactivated Some of the cells in lymph adenomatous tissue are altered in such a way as to give certain of the biological properties of normal bone marrow Dr van Rooyen noticed a relationship between the prognosis of a case of lymphadenoma and the positivity of the Gordon test It is necessary to remember that the histological picture sometimes changes at different stages of the disease

Dr ROBB SMITH said that often Hodgkin's disease does not give a positive test, but he could not deny that a special type of reticulum cell may be responsible It is important to remember that large numbers of granular leucocytes almost always do give a positive test

Dr ROSS, in reply, pleaded for careful histological examination of all suspected nodes and for better coöperation between pathologist and radiotherapist The Friedman test and sternal puncture will help to correlate different types of disease

Dr R J V PULVERTAFT (London), speaking on sterilisation of dressings and surgical appliances, expressed grave doubts of the efficacy of general hospital sterilisation Often the pressure gauges on autoclaves bear no relation to the temperature, and much of the apparatus is out of date He has isolated *Bacillus sporogenes* and *B tetani* from material alleged to be sterile The too tight packing of drums, and the including of various folded materials, is often responsible for improper sterilisation The finer the texture of a dressing the more difficult it is to sterilise and wood pulp dressings are worst Talc for the surgeons' gloves is another source of infection, and even at full pressure of the steriliser it is almost impossible to kill anaerobes Speaking of the surgeon's mask, he said his tests showed that hæmolytic streptococci may be held up in the layers of the mask during normal breathing but are forcibly expelled in large numbers when the surgeon coughs He concluded with a plea for air conditioning in all theatres and expressed the view that the impregnation of dressings with antiseptics is probably worth while

Prof C H BROWNING, F R S (Glasgow), said that publicity is needed for Dr Pulvertaft's ideas Hospital sterilisation in many cases has degenerated into a ritual—Dr PULVERTAFT, in reply, thought that its chief fault is that it is largely out of the control of the bacteriologist

Dr A C LENDRUM (Glasgow) read an occasional paper on glomangiomas

REVIEWS AND NOTICES OF BOOKS

Sterility and Impaired Fertility

By CEDRIC LANE-ROBERTS, M S Lond, F R C S, F R C O G, gynæcological surgeon to the Royal Northern Hospital, London, ALBERT SHARMAN, M D Glasg M R C O G, assistant surgeon to the Royal Samaritan Hospital for Women, Glasgow, KENNETH WALKER, M B Camb, F R C S, surgeon to the genito-urinary department of the Royal Northern Hospital, and B P WIESNER, D Sc, F R S E, consulting biologist to the Royal Northern Hospital London Hamish Hamilton 1939 Pp 410 14*s*

At a time when the population problem is being widely discussed the appearance of this book is opportune While it is uncertain how much of the nation's reduced fertility is due to an increase in involuntary sterility, it is obvious that, from the demographic standpoint, the question is far from negligible Indeed the establishment of one or more centralised clinics for the diagnosis and treatment of sterility is likely to be a part of any organised population policy which, in coming years, the Government may introduce For such clinics, this volume would be invaluable

Of the many advances which have recently been made in the analysis of sterility, none is more important than the recognition of the part which is played by the male, and the chief of the many merits of this book is that it deals in equal detail with the two sexes The causes of sterility, when systematically reviewed are so numerous and diverse that, to anyone who had not enjoyed a training in biology, it would be a source of astonishment that as many as 85 per cent of marriages are fertile The fact that several specialties—andrology, gynæcology, pathology and endocrinology—have staked out claims on the territory which this book covers imposes the necessity of multiple authorship Yet the volume has none of the shortcomings which are all too familiar in the symposium The different sections are, in the first place, exceptionally well coördinated so that there are neither inconsistencies nor matuses Then the subject matter, which is in parts (particularly those concerned with endocrinology) highly complex, is presented in a logical and carefully planned sequence with a judicious use of headings, subheadings and cross references The literary style is throughout uniformly smooth, terse and clear The whole book bears witness to an unusually strict and meticulous standard of editing The descriptions of the numerous tests in the diagnosis of sterility are supplemented by cautious evaluations of their reliability in the light of our present knowledge

The book deserves to be read by a wide medical public We hope that the authors will keep it up to date by producing revised editions as further relevant information accumulates It is attractively produced with numerous clearly explained tables and illustrations

Nelson New Loose-Leaf Medicine

Renewal pages London Thomas Nelson and Sons 1939

THE latest pages of the Nelson Loose-leaf Medicine make up the deficiencies in the work to which we have previously called attention New articles replace the old on bronchopneumonia, erysipelas metabolism obesity, beri-beri pellagra, diseases of the thyroid gland, Hodgkin's disease, tuberculosis of the lymphatics, bronchoscopy, pulmonary emphysema, and spontaneous pneumothorax, and there is a new article for the "survey volume" on sulfapyridine (M & B 693) These are reasonably uniform in plan, and present modern orthodox views in a straightforward way, with the more important references appended to each article Dr Frederick T Lord gives a detailed account of the bronchopneumonias ranging from the hypostatic type to that associated

with various specific infections, such as tularæmia and plague; perusal of this article strongly supports the impression that the old "anatomical" classification of the pneumonias has outworn its usefulness and should be replaced by one based on ætiology wherever possible In the section on emphysema, Dr. D W. Richards uses the term "obstructive" to describe the common large-lunged emphysema; this is in accordance with current American practice, but implies a theory of ætiology that is not everywhere accepted as operative in all cases The section on diseases of the thyroid, coming from the pen of Dr. J. H. Means, is authoritative, but many readers would have liked more about the heart in thyrotoxicosis Dr. Hans Kjaergaard contributes a brief but informative article on spontaneous pneumothorax, a subject which his own researches have done much to elucidate The present position of sulfapyridine (M & B. 693) is well summarised, but the mention of two isolated reports of the use of the drug in infective endocarditis and in a staphylococcal infection taken alone present an unduly optimistic picture

The Medical Applications of the Short-Wave Current

By WILLIAM BIERMAN, M D, attending physical therapist, Mount Sinai Hospital, New York City; assistant clinical professor of therapeutics, New York University College of Medicine London: Baillière, Tindall and Cox. 1938. Pp. 379. 22*s.* 6*d.*

THE doctor who proposes to apply a new agent in therapy or to extend its use should not only be conversant with the manifestations of the disease to be treated but also have some scientific knowledge of the agent he proposes to employ. Dr Bierman has wisely enlisted the services of a physicist, Myron M Schwarzschild, M.A., who has contributed a valuable section on the physical and technical aspects of high-frequency currents. Beginning with fundamentals, the reader is very gently initiated, step by step, into the secrets of ultra-short waves A good survey of European and American clinical methods is presented with commendable reserve The handbook will be found valuable to any practitioner who is thinking of using this comparatively new physical agency.

The Dream World

A Survey of the History and Mystery of Dreams. By R. L. MÉGROZ. London: John Lane, the Bodley Head. 1939. Pp. 319. 10*s.* 6*d*

DREAMS have always attracted the attention of mankind, and their interpretation has been a function of the learned of all ages To the primitive mind, a dream is a direct message from some force outside the dreamer, and the fear that it may foretell some disaster leaves him uneasy until a satisfactory interpretation has been found This idea dies hard, and we still have our quota of primitive minds in all walks of life today

Mr Megroz has made a serious study of the whole subject, and traces the story of dreams and their significance throughout history He accepts the Freudian conception of dreams but objects to its being so closely bound up with psycho-analytical therapy His examination of the subject has led Mr Megroz to believe that a dream may retell past events unknown to the dreamer, and may in some instances foretell the future He gives examples to illustrate his theories, many of them experiences of well known people Mr Mégroz makes no assertions. He puts forward his views and gives his examples, and is content to leave the reader to make his own deductions.

This book makes interesting reading and provokes thought If the author's adherence to theories which have long been considered outworn also provokes criticism, it should not on that account be too lightly dismissed.

Medical Opinions on War

Issued by the Netherlands Medical Association. Amsterdam: Elsevier Publishing Co. 1939. Pp. 72.

THIS pamphlet is issued in England by the committee for war prophylaxis of the Netherlands medical association and contains short essays by a number of psychiatrists, principally British, Dutch and American Their aim is "to enlarge the self-knowledge of common citizens and politicians. . . (They) do not pretend to any scientific discoveries; they sound the voice of medical common sense" The contributions are of unequal value and in one or two cases hardly merit the title of medical. Amid a wide variety of opinion expressed, there is, however, considerable agreement on the value of studying war from the psychological side Many of the authors draw attention to the importance of unconscious aggression, and the tendency of individuals to behave in groups on a lower cultural plane than they would if alone The relation of aggression to frustration is also frequently touched upon, and the value of reasonableness and compromise in international relations as well as in private affairs is stressed.

Few of the essayists seriously tackle the question of prophylaxis, but those who do recommend a variety of highly controversial courses From this it appears that although psychopathology has already much to contribute towards an understanding of warfare, it is altogether premature to prescribe a preventive regimen.

Chronic Arthritis

By ROBERT T. MONROE, A B, M.D, physician to the Peter Bent Brigham Hospital, and chief of the Medical Staff of the Long Island Hospital, Boston, Massachusetts London: Humphrey Milford, Oxford University Press. 1939 Pp. 84. 8*s.* 6*d*

THIS monograph is reprinted from the Oxford Loose-leaf Medicine and is an admirable exposition. The sections on pathology and ætiology are clear and comprehensive At times brevity is carried almost too far and statements are made which, while probably true, deserve fuller argument, the place of circulatory disturbances in the ætiology of rheumatoid arthritis is dealt with in five lines In conformity with the American usage the terms atrophic and hypertrophic are used instead of rheumatoid and osteo-arthritis, and no attempt is made to differentiate between rheumatoid and infective arthritis as is sometimes done in this country. Periarticular fibrositis is described as a third form and this nomenclature, which has much to commend it, enables the author to include a very useful section. The observations on prognosis in atrophic arthritis and the attitude of the physician deserve to be widely read. Treatment is practical and free from fads and a sound and useful scheme of diet is given

The book bears the stamp of wide personal experience and trained observation, and may be studied with advantage not only by the general practitioner, for whom it is primarily intended, but also by specialists in the subject

THE LANCET

LONDON SATURDAY, SEPTEMBER 9, 1939

TOWN INTO COUNTRY

BEFORE the war, as we must soon be saying, charities planned to send some town children every year for a few days or weeks into the country, and their organisers dreamt of ways and means by which all town children might go Others, more imaginative still, schemed to move out the town hospitals, leaving only enough to deal with emergencies and outpatients This week war has made these dreams come true, and though its later horrors must perhaps inevitably outweigh its early blessings at least it starts with something on the right side The actual mechanism of evacuation, both of children and hospitals, worked smoothly, and, except for some northern towns where the urgency is not so great, the task was finished by the middle of the week Between Friday morning and Sunday night the L C C, acting as the Government's agent, moved out from London half a million school-children, expectant mothers, and blind people, and on Monday these were followed by the younger children with their mothers, and their brothers and sisters of school age who had stayed behind so as to keep families together With the parties went nearly all the council's teaching staff, some 20,000 voluntary helpers to look after the pre school children, and the necessary midwives The blind and the expectant mothers near their time went by motor-coach, the others travelled by rail A quarter of those expected failed to turn up, partly because of holidays and hop picking, and many others came on the spur of the moment Nevertheless, the council were able to make good their promise that if evacuation was ever ordered it would be an orderly operation The hospitals in danger areas divided their patients into three categories those fit to go home, those fit to move but still needing inpatient treatment and those unfit to move Many in the first category were sent home before the week end The second category, the stretcher-cases, were moved out of London on Sunday, mainly by Green Line coach or private car, to the country hospitals that have been enlarged or partially emptied to receive them Only the third category remain Here again there was no major hitch

The complications of evacuation cannot yet be foreseen In the hospitals they seem likely to amount to no more than inconveniences Among the children the risk of infection cannot be denied Children from crowded cities, which may be considered as permanent epidemic centres of the common infectious diseases, are carrying specific organisms into rural districts which may be, but often are not, permanent epidemic areas for those same organisms The result will depend not so much on whence the emigrants came as on where they have gone, and the risk, where there is any, is much less to the evacuees than to those on whom they are billeted The transference from one place to another will not necessarily disturb the epidemic equilibrium provided there is no overcrowding and the two places are in a similar epidemic state Thus, if Portsmouth is evacuated into Bournemouth without overcrowding, Bournemouth has nothing to fear—a comparable migration takes place every year at holiday time and nothing usually happens Where the children are sent to small circumscribed towns such as Ipswich, as Dr A M N PRINGLE, its medical officer of health, has lately pointed out,[1] the effect may be different, for if such a town has been free from any one of the endemic infections for some time the immunity of the residents will be low and the risk of infection correspondingly high A special case is the small community relatively protected from diphtheria by artificial immunisation In some of these districts there are no chronic carriers of diphtheria and the artificially acquired immunity is sufficient to protect the population from diphtheria But if children come to such a district from an epidemic area and include, as they are sure to do, some carriers, diphtheria may spread among the non-immune residents Town children sent to isolated rural districts may then be expected to set up epidemic situations among the native population, severe if there is much increase in the population density, troublesome and lingering if the newcomers are well scattered The risks of diseases not spread by droplets will depend mainly on the state of sanitation, and here again the sparsely populated rural district is the most likely to suffer

Thus, though all reception areas must expect some increase in the number of cases of infectious disease corresponding to the increase in the population at risk, and also some interchange of parasites, it is only in the most rural areas that real trouble is likely to arise, and these must make sure that they are in as good a position as possible to deal with it Preventive measures (which are set out in greater detail on page 618) will include the examination of evacuees for obvious nasopharyngeal infection, systematic immunisation of native children against smallpox and diphtheria, adequate spacing in dormitories and schoolrooms, extra care of drainage systems and milk, food and water supplies, and adequate augmentation of isolation hospital and laboratory facilities and of the public health staff in reception areas With such precautions it is hard to believe that the ills that may befall the natives will seem of any significance when compared with the gain, both in health and experience, of the newcomers

SHOULD LOCAL GOVERNMENT INQUIRY REPORTS BE PUBLISHED?

THE system of public local inquiry is so valuable an instrument of local government administration that it may be worth while to ask whether it operates to the best advantage Recent events at Stirling offer an instance, if not perhaps a very

[1] Pringle A M N., *J R san Inst.* August 1939 p. 71

important one, for examination The Stirling borough council, having decided to remove its medical officer of health, suspended him from office and applied to the Department of Health for Scotland for the requisite statutory consent to his removal The department caused a public inquiry to be held by a commissioner, Mr. CHARLES MACINTOSH, K C, sheriff principal of Argyll, assisted by a medical assessor For some ten days the inquiry ranged over local affairs and personalities in Stirling Finally the commissioner reported to the department which has now informed the town council that the removal of the medical officer is sanctioned But apparently the council itself does not emerge scatheless from the investigation The department asks the council to send a representative delegation to Edinburgh early in September in order to discuss certain questions arising out of the inquiry The council has resolved that its full public-health committee shall represent it in the Edinburgh discussions. But some of the councillors plainly thought that the council was entitled to know in advance the subjects to be dealt with—in other words, to have the chance to prepare itself to answer criticisms, if any, contained in the unpublished report of the commissioner

The purpose of the recent inquiry at Stirling was, of course, strictly limited. The issue was whether or not the department would confirm the dismissal of the medical officer. That issue has been settled But, in the course of settling it, there were naturally complaints of existing arrangements Thus, to take a single instance, a medical witness commented on the system of examining swabs for diphtheria at Stirling "If I send in a swab at 6 P M on Friday," he observed, "it is too late for office hours: the swab is dealt with on Saturday morning and is sent to Glasgow: Glasgow receives it after office hours and deals with it on Monday: you get the result on Tuesday and the funeral is the same day." It is by no means clear that the medical officer was to blame for the system of sending swabs to Glasgow However that may be, the town council itself was in some degree on trial at the inquiry. But, whatever faults were hinted or disclosed, the peculiarities of our so-called administrative law reveal themselves The commissioner hears the evidence and forms his opinions thereon; yet he is not the judge who makes the decision Somewhere behind the scenes an anonymous official in the department studies the commissioner's unpublished report and eventually, after the file has been circulated to appropriate colleagues, the impersonal judgment is promulgated. The outgoing medical officer of health has not seen his judge face to face. The town council does not know what charges are being levelled at its administration No official report of the case will appear. There will be no statement of reasons for the departmental decision such as would help Scottish local authorities in similar positions another time

These comments are not intended to suggest that there is anything improper about our system of local government inquiries The inquiry is not a criminal trial. Local feelings have been usefully ventilated The citizens in Stirling and elsewhere are in consequence able to feel that no scandal is being hushed up Indeed the system of such inquiries was justified after a strong legal challenge in Local Government Board *v* Arlidge in 1915 The House of Lords then upheld the departmental method, incidentally correcting the Court of Appeal wherein the judges by a majority decision had said that the method was contrary to "natural justice" Nobody can doubt that the best way to remove any possible deficiencies in public-health administration in Stirling is for the public-health committee to discuss matters with the central department. Nevertheless there remains the question whether our central authorities' control is not at times a little too mysterious and secretive The Arlidge case concerned a property-owner's objection to a closing order for a house in Hampstead alleged not to be fit for human habitation It was therefore quite different from the issue in the Stirling case But there is one feature common to both occasions—the non-publication of the report of the person holding the inquiry. The late Lord SUMNER made some characteristic observations in the Arlidge case which the Committee on Ministers' Powers thought worth quoting in its report in 1932 "If it was our function," he said, "to advise the Local Government Board as to its procedure generally . . . I should for my part suggest that the more open the procedure is the better By all means let both the appellant and the local authority see the inspector's reports; a discreet and careful officer is not likely to offend, and if, in spite of discretion and care, he is harassed by actions for libel, he may well be defended and indemnified by his department By all means let the appellant, and the local authority too, if it wishes, see and address the judge: it is all in his day's work. By all means let the appellant have the last word and as many of them in reason as he likes. Time spent in removing a grievance, or in avoiding the sense of it, is time well spent; the Board's officials will, like good judges, amplify their jurisdiction by rooting it in the public confidence."

ŒSTRONE AND PROGESTERONE IN THE ADRENAL GLAND

SINCE GORDON HOLMES gave his now classical description of virilism in a woman cured by the removal of an adrenal tumour, several similar cases have been reported, and it is now well established that overgrowth of the adrenal cortex may lead to masculinisation of the secondary sexual characters and to retrogressive changes in the internal reproductive organs. Complementary observations have been made on analogous, but much rarer, cases in which a partial feminisation of men has occurred from a similar cause [1]

For many years no satisfactory advance was made in the analysis of this peculiar relationship between the adrenal cortex and the sex characters, but lately advance has come from three sides The importance of the adrenal cortex in the body's

1 Simpson, S L, and Joll, C A, *Endocrinology*, 1938, 22, 50

economy has led to much work on the identification and preparation of the life-maintaining principles of the cortex, which prove to be of very similar chemical constitution to the hormones of the gonads[2] Secondly, examination of the urine in cases of adrenal tumours and adrenal hyperplasia, associated with masculinisation or feminisation, has shown that this is one of the few conditions, other than pregnancy, in which an easily detectable abnormality can be found in the hormonal activity of the urine An excess of androgenic material is associated with masculinising tumours in women[3 4] and an excess of œstrogenic substances with feminising tumours in men[5] The excess androgenic activity seems to be largely accounted for by the presence of massive amounts of *trans* dehydroandrosterone, but as this substance is a very weak androgen it is perhaps only an excretion product of the androgenic substance primarily responsible for the masculinisation The additional œstrogen in the urine of males with adrenal tumours has not been identified with certainty, but is probably œstrone An extragonadal source of sex steroids is also implied by another observation made in the course of hormone analysis of body fluids—i e, that gonadectomy does not cause the disappearance of androgens and œstrogens from the urine—and of possible sources the adrenal gland is much the most probable[6]

The third line of approach consists in the examination of cortical tissue itself for the presence of substances identical with, or of similar biological activity to, the well known hormones of the ovary and testis The first success in this direction was attained in 1936 by REICHSTEIN, who isolated from adrenocortical extracts a substance, "adrenosterone," which had definite androgenic properties as tested on the capon comb, and which differed from well known members of the androsterone-testosterone series only in having an extra oxygen group in the molecule His discovery indicated that substances with sex hormone activity are present in the cortex, although the particular substance adrenosterone, being a weak androgen, is perhaps unlikely to be responsible for the major phenomena of virilism in women In the past year, two observations have been made which definitely link the adrenal gland metabolically and perhaps endocrinologically with the gonads BEALL and REICHSTEIN[7] and BEALL[8] have isolated, from concentrates of very large amounts of ox adrenals, a substance identical chemically and biologically with the hormone of the corpus luteum, progesterone, which previously had been obtained only from the corpus luteum itself Very recently BEALL[9] has also obtained from adrenal extracts œstrone in crystalline form identical with the substance found in human pregnancy urine The latter observation is especially striking since œstrone has not yet been isolated in pure form from the ovary, and BEALL's isolation of it from the adrenal cortex is its first preparation in pure form from any kind of tissue

These three lines of work point quite definitely to the fact that the adrenal gland normally contains—probably as the result of elaboration there—small amounts of substances identical with or similar to the hormones of the gonads, and that under certain conditions of hyperplasia or malignant growth the output of these or similar substances can so be augmented that the sex characters of the subject are fundamentally altered It is impossible with our present somewhat limited knowledge of the metabolism of the steroid substances to postulate whether this anomalous presence of biologically active substances in the cortex is incidental to the large scale production of the chemically similar life maintaining hormones, or whether they are produced by the cortex independent of the elaboration of corticosterone In this connexion, of course, a study of the sex steroids present in the cortex or excreted in the urine in cases of known deficiency of the life-maintaining principles, as found in Addison's disease, would be instructive, but progress of this kind is necessarily slow Moreover, it should be emphasised that the observations on the urine in cases of adrenal hyperplasia and adrenal tumours, as well as of the physiological effects of these conditions, have all been on the human subject, whereas the large scale examination of adrenal extracts has necessarily been carried out on animal material It seems likely, however, that this separation will not be permanent DAVIDSON and MOON[10] have shown, for instance, that the artificial stimulation of the adrenal cortex by the administration of corticotrophic extract of the anterior pituitary may cause some restoration of the atrophic accessory sex organs of gonadectomised male or female rats Conversely, the development of microchemical methods will probably make possible the chemical examination of hyperplastic or tumourous adrenals, or even of the normal gland

10 Davidson, J A and Moon, H D *Proc Soc exp Biol* 1936 35, 281

2 Reichstein, T *Ergebn Innern Hormon forsch* 1938 1, 334
3 Simpson, J de Fremery, P and Macbeth, W *Endocrinology* 1937 20 463
4 Callow, M A *Proc R Soc Med* 1938 31 841
5 Burrows, H, Cook, J W Roe, J M F and Warren, F L *Biochem J* 1938 31 950
6 Parkes, A S *Lancet* 1937 2 902
7 Beall, D and Reichstein, T *Biochem J* 1938 32 1057
8 Beall *Nature Lond* 1938 142 479
9 Beall *Brit Med J* July 8 1939 1 76

The International Hospital Association Congress at Toronto arranged for this month has been postponed indefinitely

The annual conference of the Sanitary Inspectors' Association, which was to have been held at Bournemouth this week has been postponed

The Tavistock Clinic (for functional nervous disorders) has now been transferred to the Orchard Wing Westfield College Kidderpore Avenue Hampstead, N W 3 (Tel Hampstead 1626) near the junction of Finchley Road and Platt's Lane In addition to the usual work of the Clinic private practice on a pooled basis is being carried on by a large resident staff Appointments for both Clinic and private patients will be made by the Secretary at any time

The Lancet will for the present be printed at Aylesbury and urgent communications may be addressed to the editor at Messrs Hazell, Watson & Viney's printing works there The London office remains open at 7, Adam Street, W C 2 (Tel Temple Bar 7228 9)

ANNOTATIONS

DRUGS IN WAR-TIME

THE outbreak of war finds this country in a far better state as regards supplies of essential drugs than was the case in August, 1914. Under the protection of the Safeguarding of Industries Act the manufacture of medicinal chemicals and synthetic products has become a staple industry of Great Britain and there is no need to fear a shortage of such articles. The raw materials of this industry are available in sufficient quantity to ensure that the large existing stocks of the finished products can be replaced as need arises. No likelihood of substantial advances in the prices of drugs in this category can be foreseen at the moment and certainly no famine in them is conceivable. At all times, however, it is desirable that care should be taken to conserve stocks and to avoid waste and at no time should the rules of economy be observed more rigorously than in time of war. Many important drugs are brought to this country by sea and a number of others require for their production raw materials which also have to be imported. Thus this country depends for its supplies of the vast majority of the items of vegetable materia medica upon outside sources; similarly our requirements in the way of metals, mercury, and bismuth have to be derived from abroad and the same applies to bromine and iodine. While then Great Britain is self-supporting so far as its needs for the coal-tar derivatives used in medicine are concerned, there may later be occasion for economy in some other categories. Substantial stocks of mercurials, bismuth salts, bromides, and iodides are, we have no doubt, held in reserve while our supplies of the primary products from which they are manufactured will be controlled by the Government. Of the alkaloids, quinine, morphine, and codeine are prescribed more frequently in war-time than in normal times; all three are derived from vegetable raw materials brought here from other countries. It may be assumed that there are considerable reserves of these alkaloids as well as of cinchona bark and opium, and that, if necessary, steps will be taken to prevent any improper hoarding of stocks. Under the defence regulations the Government has power to require any person to furnish an estimate of the quantity of any substance held by him and to requisition all or any quantity of any article so held. It would be difficult to estimate the total quantities of any one of the many hundreds of vegetable drugs used in medicine, whether as powder, extract, tincture, or some other kind of galenical preparation. Apart from the stocks in bonded and other warehouses and in the premises of dealers, manufacturing druggists and wholesale houses there are some sixteen thousand chemists' shops and many thousands of other stores among which stocks are distributed. Should a temporary scarcity of any such drug arise as time passes the fact will be made known to members of the medical profession so that they will have an opportunity to adjust their prescribing.

FAMILIAL ADENOMATOSIS

MANY interesting and important facts about familial adenomatosis of the colon and rectum, or polyposis intestini, are set out in the paper by Lockhart-Mummery and Cuthbert Dukes on p. 586. The genealogical tables of ten families afflicted with this disease show clearly its hereditary nature. It may be transmitted by either sex, and is apparently due to a gene defect, which is responsible for an unduly active growth of the intestinal mucosa, followed by the formation of areas of hyperplasia, and later multiple adenomata. The active mitosis which is inevitably present helps to explain the development of carcinoma as a secondary phenomenon. It is shown that adenomata develop at about the age of 20 years, while malignant changes follow in the decade 30–40 or even earlier, hence polyposis should be suspected whenever a young subject is found to be suffering from cancer of the rectum. More than one focus of carcinoma is frequently present. A recent paper by Coffey and Bargen[1] also stresses the liability to malignancy; they found carcinomatous changes in 62·5 per cent. of cases of true adenomatosis (as distinct from the pseudo-polyposis associated with chronic ulcerative colitis), and in 25 per cent. there were multiple carcinomas. A useful clinical point mentioned by Lockhart-Mummery and Dukes is that polypi which are actively growing are darker in colour (dark red or brown) and firmer in consistence than quiescent growths. Coffey and Bargen also say of carcinomatous polyps that they presented "a dusky red hemorrhagic appearance which immediately aroused a suspicion of their malignant nature." The treatment of polyposis is a difficult problem, there is at present no known method of preventing the development of polypi. Since members of these families are faced with the grim prospect of years of medical supervision, with multiple sessions for sigmoidoscopy and fulguration of polypi, finally culminating at an early age in colectomy or radical excision of the rectum and pelvic colon for malignant disease, one may hope that polyposis families will remain small and finally die out as the result of celibacy or the adoption of eugenic principles. Married persons found to be suffering from polyposis should certainly be informed of the familial nature of the disease.

TREATMENT OF BURNS

THE weakness of tannic acid in the treatment of burns lies in its comparatively poor antiseptic action; the eschar fauly often gets infected, and the burn can then no longer be treated as a dry wound. In gentian violet a substance has been found that is non-irritant, strongly bactericidal and analgesic, but unfortunately it is a poor coagulant of devitalised proteins, and the eschar takes a long time to form. Its bactericidal action, according to Chen,[2] is exhibited mostly against bacteria of the gram-positive groups, and hardly at all against *Bacillus coli* or *B. pyocyaneus*. Chen in Peiping and Blackfield and Goldman[3] in San Francisco have been trying to evolve a technique that will combine adequate coagulation with efficient antisepsis. The American surgeons, who have worked mainly with severe burns in children, first immerse the patient in a tannic-acid bath in which ointments and the like, blebs and loose necrotic tissue are removed. Then, after drying the patient with sterile towels, they apply gauze soaked in 10 per cent. silver nitrate to the burnt area; this effectively seals the area before it has a chance of being infected. The patient is next placed on a sterile sheet under a large cradle kept at 85°–90° F. For the first few days the entire burnt area, including its edges, is treated several times a day with a 1 per cent. aqueous solution

1 Coffey, R. J., and Bargen, J. A., *Surg. Gynec. Obstet.* August, 1939, p. 136.
2 Chen, C. Y. *Chin. med. J.* 1939, 55, 407.
3 Blackfield, H. M., and Goldman, L., *J. Amer. med. Ass.* 1939, 112, 2236.

of gentian violet Chen's experience has been mostly with the less extensive type of burn, only five of his patients were bad enough to be admitted to hospital He does not use tannic acid but first cleans the burn with boric-acid solution or normal saline removing oily dressings, if they have been applied, with soap, blisters are opened and loose epidermis cleared away He then applies a 1 per cent aqueous solution of gentian violet (crystal form) to the affected area, and after an interval of five to ten minutes applies the silver-nitrate solution The gentian violet is reapplied two or three times at fifteen minute intervals, and when the surface has been exposed to the air for two hours the patient is allowed to go home No direct dressings are applied after the first treatment, the burns being either left uncovered or guarded by iron wire screens covered with dry gauze The dye is reapplied once or twice on the second day, and the wounds are then covered with a dry dressing which is removed for inspection daily for the first two to three days, and after that only every four days In cases known to be infected with *B coli* Chen replaces the gentian violet by a mixture of gentian violet, acri flavine and brilliant green He says that only the first dressing is painful, and healing is very prompt The eschar formed with gentian violet is pliant and does not crack in the body folds or at the edges, but its removal is not always easy Chen recommends saline compresses to loosen the parts of the eschar that have not peeled off at the end of three or four weeks, but Blackfield and Goldman have not been satisfied with this method They hold that any eschar remaining after this period covers third- or deep second degree burns and that if it is merely soaked off epithelisation will not take place They favour surgical removal of the eschar under light general anæsthesia, and preparation of the resulting raw area for skin grafting

PITFALLS IN INJECTING FOR HERNIA

REPORTS on the injection of sclerosing solutions for the cure of hernia usually make little mention of the unpleasant results that may follow possible accidents Perhaps most of these reports are written by the specially skilled at whose hands accidents do not happen Wernicke[1] however feels it necessary to emphasise the fact that injecting a hernia is not a simple matter like giving a hypodermic injection The two most serious calamities which can occur are injection into the peritoneal cavity and injection into the deep epigastric vessels Wernicke quotes two deaths, reported by another writer, in which the solution was injected into the bowel wall with resulting gangrene perforation and peritonitis, he adds that it is quite wrong to think that intraperitoneal injection is not of serious consequence Injection into the deep epigastric artery may be followed by sloughing of the deep tissues The obvious safe guard is to withdraw the plunger a little way before starting the injection All patients who experience severe abdominal pain after injection should be treated as potential cases of peritonitis and kept under careful observation

Œdema of the cord, hydrocele of the cord epididymitis and dermatitis under the truss worn during treatment all seem to be of minor significance but it is as well to recognise that they may occur Abscess formation may be troublesome and does occasionally arise even in skilled hands Harris and White[2] report a series of 236 cases treated by injection with out a single serious complication No abscesses occurred and no impotence resulted They consider that there is little difference in the fibrosis produced by the two types of solution in popular use—those containing tannic acid in alcohol and those containing a fatty acid basis It is perhaps as well to mention that the solutions in use for the injection treatment of varicose veins are not suitable Wernicke believes, as a result of experimental work, that phenol alcohol-thuja solution gives the most enduring scar tissue

It is rather disappointing that these authors fail to restrict the injection treatment to the small indirect inguinal hernia in healthy patients, in fact to the cases which most certainly give good results from operation Harris and White have taken great pains to analyse their results and compare them with results of operation The analysis is in favour of operation It has at times been urged that treatment by injection saves the patient time and money Thus Harris and White are inclined to doubt, the prolongation of the treatment and the number of visits entailed cause great inconvenience Wernicke thinks that 10 injections should suffice for most cases, and that when 20 or 40 are required the case has been badly chosen He gives a good practical tip to prevent the formation of subcutaneous nodules The syringe should contain a little air above the solution, and, after the injection, this air is forced through to clean the needle before its withdrawal

1 Wernicke H O *Surg Gynec Obstet* June 1939 p 1091
2 Harris E I and White A C *J Amer med Ass* 1938 111, 2069

TETANUS ANTITOXIN

SOME confusion may still exist owing to the two units employed for expressing dosage of tetanus antitoxin The international unit (I U), adopted by the Permanent Commission on Biological Standardisation, is now used in this and many other countries, whereas the American unit (A U) is still employed in the United States and elsewhere The relation between A U and I U is 1 2 The routine prophylactic dose at the beginning of the last war was 500 A.U, and there was a tendency later to increase this to 1000 or even 1500 A.U The memorandum issued by the Director General of Emergency Medical Services last week (see *Lancet*, Sept 2, 1939, p 578) recommends a prophylactic dose of about 2600 I U, equivalent to about 1300 A.U, or some two and a half times the old routine dose

OXYGEN AND THE BRAIN

ALTERATIONS in brain metabolism—mainly and essentially a matter of the burning of dextrose—occur in the new "shock" treatments of schizophrenia, and many attempts have been made to find in them the effectual happening common to all these therapies Some have assumed that cerebral anoxia is the answer[1] Russell Fraser and Reitmann[2] in this country, and Himwich[3] and his associates in the United States, have turned this interpretation to practical account by causing in schizophrenic patients temporary acute anoxia by the inhalation of nitrogen The therapeutic value of the method is doubtful, but the significance of cerebral anoxia remains an urgent question Gerard[4] who has lately reviewed the whole topic would attribute the effect of thyroid treatment in schizophrenia to its power of increasing the rate of respiration and the use of sugar in the brain, he regards the low basal metabolic rate and the relative insensitiveness to thyroid of one group of schizophrenics as prima facie evidence of lowered brain

1 See *Lancet* 1938 1 37 210
2 Fraser R. G. *Neurol Psychiat.* 1939
3 Himwich H. E., Alexander L. & D. and Lipets B. *Proc exp Biol Med.*, N. Y. 1938, 39, 26
4 Gerard R. W. *Arch Neurol Psychiat*, Chicago 1938, 42, 93

metabolism He suggests that as the cortical brain potentials are increased in rate and amplitude after acute anoxia, there is neuronic stimulation either during the early stages of decreased oxidation or "on the rebound" after it; hypoglycæmia acts much like *hypoxia on the function of the brain, leading to this secondary "overshooting"* with increased activity which may be the basis of the therapeutic action Gerard would attribute the improvement in the schizophrenic to the increase in the respiration of his brain which may be so caused, and points to the findings of Kerr and of Ghantus[5] that the neurological complications of hypoglycæmia correspond less to the hypoglycæmia in the blood than to the glycogen content in the brain

That there are difficulties in the way of *accepting* cerebral anoxia as the common feature in Cardiazol, insulin and other physical methods of treating schizophrenia may be seen from the study by Stone[6] of the effect of various drugs upon the lactic-acid content of the brain in mice. These small animals were chosen because they could be plunged into liquid air and frozen instantaneously without the anæsthetics and surgical procedures, or the post-mortem changes, which would interfere with accurate estimation Stone found that during insulin convulsions the amount of lactic acid in the brain is significantly decreased, and that a similar decrease sometimes takes place during severe insulin hypoglycæmia without convulsions; a decrease also occurs during anæsthesia. If convulsions are induced with cardiazol, however, the lactic-acid value in the brain remains normal or is significantly increased; picrotoxin produces an increase, too, above the level that can be attained in normal mice after strenuous exercise, and in cyanide convulsions the increase is large. But during nicotine convulsions there is no significant alteration in the amount of lactic acid in the brain

These striking differences between the effects of common convulsants and those of anæsthetics or hypoglycæmia deserve attention Although the mechanism of glucose katabolism in the brain is still obscure, certainly an alteration in lactic-acid content in one direction is not easily made compatible with the view that much the same disturbance of oxidative activity in the brain is taking place then as when the lactic-acid change is in the opposite direction. Stone's findings also run counter to Quastel's[7] hypothesis that the anæsthetic action of drugs—as employed in the continuous narcosis method of treatment of psychoses—is due to specific inhibition of some part of an enzyme system concerned in the oxidation of carbohydrate products, such as lactate; if that were so, one would expect an increased lactate content during anæsthesia, whereas Stone found it to be lowered

Stone discusses various hypotheses to account for his observations, such as that the lactic-acid content is dependent on the activity of the tissue, being highest during convulsions, or that analeptics inhibit some part of an enzyme system, as in Quastel's explanation of the action of anæsthetics, but the readings obtained for nicotine convulsions are not consonant with either of these hypotheses Since, moreover, normal or low readings for lactic acid in the brain were obtained in conditions, such as ether anæsthesia and insulin convulsions, in which there is a high proportion of lactic acid in the blood, it is presumably not from the blood that the extra lactic acid in the brain during picrotoxin or cardiazol convulsions is derived. Stone mentions the possibility that in the latter two conditions the high values may be due to circulatory disturbances resulting in cerebral anoxæmia this would leave unexplained the readings in hypoglycæmia It is evident that cerebral metabolism is a field for active research in psychiatry as well as in physiology.

5 Kerr, S. E. and Ghantus, M. *J. biol. Chem* 1936, 9, 116
6 Stone, W. E. *Biochem. J.* 1938, 32, 1908
7 Quastel, J. H., and Wheatley, A. H. M. *Ibid*, 1934, 28, 1521.

SURGERY OF GALL-BLADDER AND BILE-DUCTS

THE history of the surgery of an organ is not only of interest in itself, but in addition it frequently conveys valuable lessons which, by analogy, can be applied in other directions With this in mind, Prof Grey Turner opened his Lettsomian lectures[1] on the surgery of the gall-bladder and bile-ducts with a survey of the history of the subject The later phases in the development of the surgery of the bile-passages are made particularly interesting by the author's personal knowledge of many of the pioneers With an experience of 1040 operations on the gall-bladder and bile-ducts to his credit, Grey Turner's opinions *necessarily carry much weight. Having lived and operated throughout the period of the great "cholecystectomy versus cholecystostomy" controversy, such an experienced operator still has occasion sometimes to employ the latter operation.* His warning quotation from a friend that "a living problem is better than a dead certainty" might well be taken to heart by the type of surgeon who sets out to remove the gall-bladder at all costs, and whose skill is sometimes no better than his judgment

It is a surprise to find Professor Turner stating that in his experience cholecystitis apart from gall-stones is an uncommon disease in this country It is not clear with what diagnosis he would label the large number of patients with flatulent dyspepsia, tender gall-bladder, positive cholecystographic evidence, and possibly infection of bile taken from the duodenum. There is still considerable controversy as to whether the acutely inflamed gall-bladder should be operated on as a matter of urgency or should be allowed, if it will, to subside before operation is undertaken. Professor Turner is on the side of early operation, but advocates simple drainage in preference to removal His reasons are the added risks of bleeding, the increased danger of injury to the ducts and the possibility of later sclerosis of the common duct, if cholecystectomy is carried out in the presence of acute inflammatory changes It is a compliment to the sound judgment and careful presentation of facts in these lectures, that one regrets what is not there. In particular we should have welcomed the author's views on the many pathological and clinical problems associated with cholesterosis, but on this matter he has contented himself with a brief reference to the uncertainty of the results of cholecystectomy for "strawberry gall-bladder."

1 Turner, G. Grey, *Proc. Med. Soc. Lond.* 1939.

A 'France" pension of £30 per annum will be filled shortly by the council of Epsom College Candidates must be fully qualified medical men of not less than 55 years of age, whose income, independently of any allowance from the Royal Medical Benevolent Fund, does not exceed £100 a year, if single, and £150 if married Two or more St Anne's scholars will also be elected by the council. Candidates must be fully 9 years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than 5 years The value of each scholarship is dependent upon the means of the applicant and the locality and fees of the school selected Forms of application for the pension and scholarships may be had from the secretary of the college, 40 Bedford Square, London, W.C.1, and must be completed and returned by Oct 15

SPECIAL ARTICLES

ADMINISTRATION OF FLUIDS TO SURGICAL PATIENTS*

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IN order to formulate simple rules for the administration of fluids and sodium chloride, intravenously or per rectum, a study of the problems of fluid balance has been carried out in the wards of the surgical professorial unit at St Bartholomew's Hospital during the past three years It has been found possible to eliminate entirely postoperative dehydration and œdema, even with such complications as intestinal obstruction, or paralytic ileus, and the increased comfort and smooth convalescence of all patients requiring parenteral fluids has been particularly gratifying

It must be emphasised that fluids are always given by mouth after surgical operations unless there are *contra indications If, owing to nausea or post-operative vomiting,* adequate oral intake is not possible, this is supplemented by fluids given per rectum, or occasionally, intravenously After all operations on the gut, fluids by mouth are withheld for 24–48 hours or longer This routine diminishes the incidence of postoperative distension and paralytic ileus and may limit the spread of infection in the peritoneal cavity In such cases the method of choice is the administration of fluids per rectum, but this is inadvisable after operations on the rectum or distal colon and intravenous therapy is then required

Much has been learnt in recent years about the normal water balance of the body, and its application to *surgical patients* is due largely to Coller and Maddock (1934–37) who demonstrated the quantity of fluids required by patients after operation, and for the control of *dehydration* They have shown that a sick surgical patient requires at least 3600 c cm of fluid a day

The fluid-loss of a normal person is approximately as follows (Starling 1936)

Urine	1500 c cm
Skin	600 c cm
Lungs	400 c cm
Fæces	100 c cm
	2600 c cm

It is not sufficiently realised that a normal person loses nearly 1000 c cm of water daily by *insensible* perspiration from the skin and as water vapour with expired air There is commonly profuse sweating during and after a general anæsthetic or a prolonged operation, which greatly increases the fluid loss There is no record of this normal fluid loss on the temperature chart and it is commonly overlooked On no account must the urine output be considered as a true index of the water loss of the body for the skin and lungs sometimes (diarrhœa and vomiting) tissues (œdema) all have first call on the available water With the water that remains, the kidneys must excrete the waste products of the body amounting to about 35 g a day Even when the kidneys are concentrating urine to a specific gravity of 1032 500 c cm of water is needed (Lashmet and Newburgh 1937) A damaged kidney able to concentrate only to 1010 will need 1500 c cm to excrete the normal waste products, and if this is not available nitrogenous retention will occur

To allow for the increased loss of fluid by sweating a patient should receive at least 3600 c cm of fluids in the 24 hours after a major operation On the following days 3000 c cm is usually sufficient It may be thought that such a fluid intake is never achieved by healthy people, but it must be remembered that the water contents of solid foods contribute over 800 c cm and the water of oxidation a further 350 c cm

In the past many patients have been fortunate if they have received half this quantity, and a negative fluid-balance was inevitable Even moderate restriction of fluid is *badly borne by healthy people, and* much more so by patients who have had a major surgical operation Although morphia may allay *much discomfort, dehydration, with its many risks* is a serious burden for a critically ill patient, and must materially affect the prognosis

Not only have many patients received too little fluid, but they have often been given too much salt The basic need of the body is only 1–2 grammes a day (Falconer and Lyall 1937) and a normal diet may contain 5–10 g, but 5 g is probably a sufficient allowance If a surgical patient is given his correct postoperative fluid allowance (3600 c cm) as isotonic normal saline, he will receive as much as 32 g in the 24 hours, and may have difficulty in excreting this amount This has been shown by determining the chloride excretion in the urine (Avery *Jones and Naunton Morgan 1938)* It was shown by Baird and Haldane (1922) that 35–40 g of sodium chloride taken in a day by a healthy man caused visible œdema *The sodium chloride retains* water in the tissues, and there may be an increase in blood-volume as shown by a fall in the hæmoglobin percentage The associated fall in *plasma proteins* is dangerous, for this facilitates the retention of water in the tissues and the production of œdema, which may hinder the healing of wounds or may waterlog the lungs These risks have been emphasised by Maddock and Coller (1934), Mauzels and Smith (1934), Walther (1937) Falconer and Lyall (1937), and Bartlett, Bingham and Pedersen (1938)

The *regime recommended is to give dilute saline* so that the uncomplicated case will receive about 5 g of sodium chloride a day When giving rectal fluids, one volume of normal saline to four volumes of tap water is used , for intravenous injection, one volume of normal saline to four volumes of 5 per cent (isotonic) glucose in distilled water

In addition to this basic allowance of fluid, extra normal saline is given to cover exactly any loss of intestinal fluid or blood If the patient has vomited 1000 c cm then he is given 1000 c cm of normal saline in addition to his daily allowance of dilute saline This principle of replacing lost intestinal fluid by normal saline has also recently been advocated by Bartlett, Bingham and Pedersen (1938) who also have found it successful

SOLUTIONS USED

0 18 per cent sodium chloride (one part of normal saline to four parts of tap water) —This solution is given per rectum as a continuous drip (60 drops per minute, using a No 6 rubber catheter) and it is usually

* Based on a full report published in *St Bartholomew's Hospital Reports* 1938

retained very well It is uncommon to give less than 3000 c cm. in twenty-four hours, and we have given as much as 6000 c cm

4 per cent. glucose, 0 18 per cent sodium chloride (one part of normal saline to four parts of 5 per cent glucose in distilled water) —This solution is isotonic and is given intravenously as a continuous drip. At the rate of 3000 c cm a day, it supplies 120 g. of glucose and 5·4 g of sodium chloride The tendency to thrombosis of the vein is perhaps greater than with normal saline; it is usually necessary to change the vein after forty-eight hours, but the same vein has been used for as long as five days. The solution may be given per rectum, but we have found that it is not so well retained as the saline diluted with tap water

0 9 per cent. sodium chloride (normal saline). —This solution may be given intravenously, but it is not as well retained when given per rectum as 1/5 normal saline Its indications are:

1. Volume for volume to replace any lost intestinal fluid
2. To replace blood loss, if a blood transfusion is not given.
3. To be given if there is severe shock, while waiting for a blood transfusion.

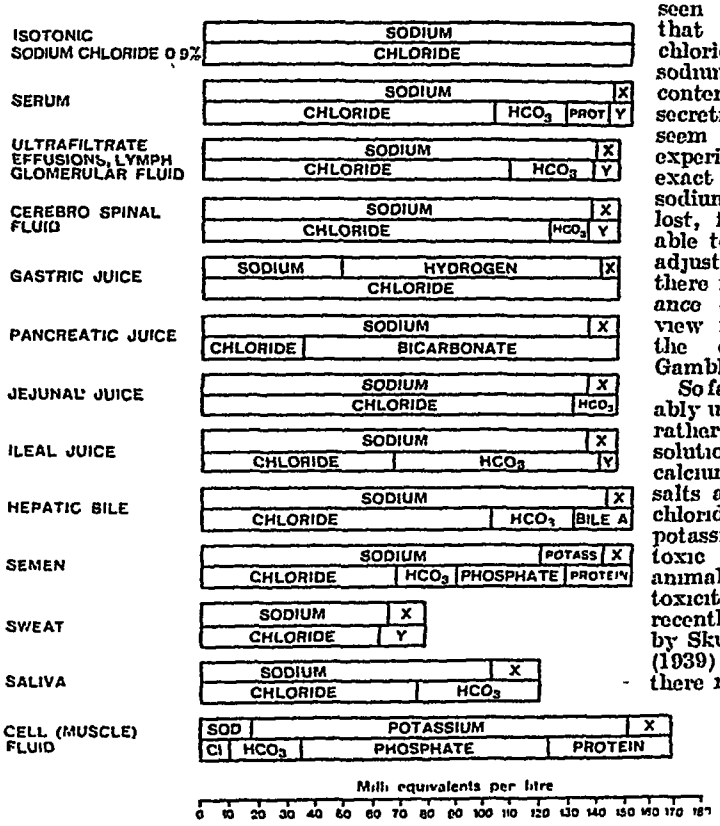
Hypertonic saline has a limited application, for in surgical patients there is never loss of salt without loss of water Both can be replaced by normal saline. Hypertonic saline, however, is of value in cases of established paralytic ileus, where there may be considerable stagnation of fluid in the dilated loops of intestine Three hundred c cm. of 5 per cent sodium chloride may be given in order to reverse the flow of secretions and return fluid from the gut into the blood

It will be observed that we do not use the common 5 per cent dextrose in normal saline This is hypertonic, and contains too much salt for routine use It must be added that whenever possible, intestinal secretions should be returned to the intestine—e g bile from a fistula, or from drainage of gall-bladder, should be returned to the stomach through a Ryle's tube or nasal catheter

Using these simple rules during the past two years, it has been found possible to keep the blood chemistry practically within normal limits, even when there has been continuous gastric drainage for as long as nine days The patients have not shown evidence of dehydration, and have not suffered from thirst

Male aged 46 —Partial gastrectomy for gastric ulceration. He vomited 1000 c cm. the third day after operation. A Ryle's tube was passed into the stomach and continuous suction begun with a Wangensteen apparatus. A few days later the drainage was stopped, but vomiting recurred and radiography showed a much dilated duodenal loop and barium did not pass into the jejunum. An entero-anastomosis was performed and convalescence was subsequently uninterrupted.

Aspirated gastric contents, or vomitus, may contain as much as or more sodium than is present in blood. Bartlett (1938) and his co-workers found an average concentration of 5 7 g. of sodium chloride per litre in one hundred 24-hour specimens of gastroduodenal drainage Since sodium is the main base of the extracellular fluids, when it is lost from the body, there must be a reduction in the volume of these fluids This dehydration cannot be repaired by water alone, for this could not be retained in the tissues without profoundly upsetting the osmotic pressure. Sodium must be given in addition. It will be seen from the table that isotonic sodium chloride will cover the sodium and chloride content of any intestinal secretion. It does not seem necessary in our experience to give the exact proportions of sodium and chloride lost, for the body is able to make its own adjustments provided there is a liberal allowance of water. This view is confirmed by the observations of Gamble (1929).



Composition of the body fluids.
X = unnamed basic radicles Y = unnamed acid radicles
(After R. A. McCance, Lancet, 1936, 1, 704)

So far we have invariably used normal saline rather than Ringer's solution, which contains calcium and potassium salts as well as sodium chloride Intravenous potassium is extremely toxic in experimental animals and its possible toxicity in man has recently been reviewed by Skudder and others (1939) In any case there may be a moderate allowance of potassium from the body proteins which are broken down when intravenous or rectal fluids are given, for it is impossible to give proteins by these routes. Again, the stores of calcium in the body are so large and labile that it hardly seems necessary for a few days to add the small amount in Ringer's solution. These are, however, theoretical points, and there seems scope for further biochemical investigation Using isotonic glucose and isotonic saline in varying proportions has the advantage of simplicity.

It should be noted however that Falconer (1939) has reported favourably on the use of Ringer's solution in established cases of dehydration, and its use has also been advocated by Graham (1937).

Intravenous therapy is at present a very incomplete diet, and should not be continued longer than absolutely necessary.

MANAGEMENT OF CASES COMPLICATED BY ABNORMAL FLUID LOSS

It is essential to record the fluid intake and loss on the temperature chart, so that the fluid balance can be seen at a glance Daily estimation of the

Days	1 Op	2	3	4	5	6	7	8	9	10 Op	11	12	13	14	15
Fluid intake—															
By mouth			450	2040		420		970	990			465	1440		
Per rectum															
N/5 saline	3000	3000	1000												
N saline				1500											
Intravenously															
4 per cent. dextrose in 0·18 per cent NaCl					2000	2150	2500	2500	1500	3200	3000	3300	2000		
N saline					650	400	1450	550	1030						
Fluid loss—															
Vomit				1600					450						
Gastric drainage					550	500	1350	600	690						
Urine		700	1500	2350	1000	700	750	1150	1350	450	850	1350	1300		
Blood—															
Blood urea mg per 100 c cm			35			54		40		32		47		25	
Alkali reserve Vols CO_2 per 100 c cm			58 7			60 4		67 0		61 7		55 5		60 4	
Plasma chlorides mg NaCl per 100 c cm			588			611		595		597		559		582	

Op = Operation

haemoglobin percentage is of great value in all difficult cases If there is concentration of the blood as with dehydration, the haemoglobin will rise, if there is hydraemia due to retention of excess sodium chloride, there will be a corresponding fall in the percentage of haemoglobin Of course blood lost at the operation will cause a fall at the rate of 12 per cent for every 600 c cm of blood

The simplest test on the urine is for chlorides If absent, the intake of sodium chloride may be increased, but this is seldom necessary on this regime If a patient is having an adequate intake of sodium chloride a sudden decrease in the output of chloride may herald postoperative distension and paralytic ileus, for there may be accumulation of intestinal fluids rich in chlorides within the distended gut Whether or not chlorides are present in the urine depends on the chloride intake and it must be remembered that a patient having water alone may have a normal convalescence although chlorides are absent from the urine for five to ten days In a patient with ileus, the presence of chlorides in the urine is particularly reassuring to the surgeon It means, of course, that treatment has restored the plasma chlorides to their normal level In difficult cases it is of value to have a daily determination of the blood urea If it rises above 60 mg per 100 c cm, the fluid intake should be increased and the plasma chlorides and alkali reserve determined

The intelligent administration of fluids after operation adds much to the comfort of the patient, and may favourably influence the prognosis The underlying principles are simple, and if followed, even in difficult cases there is seldom need for elaborate biochemical control of the blood

The following routine has been established

1 *After an operation on the stomach or small intestine or when peritonitis is present*—First day nothing by mouth, morphia gr 1/6 or heroin gr 1/12 six hourly, 3000 c cm 1·5 normal saline in tap water per rectum Second day 3000 c cm per rectum Third day: if percussion is audible, fluids by mouth, 600 c cm and 2100 c cm per rectum Fourth day fluids by mouth

2 *After an operation complicated by vomiting* (e g with acute dilatation of the stomach vicious-circle vomiting)—Pass nasal catheter through nose into stomach, and establish continuous drainage with a Wangerstеen apparatus Start intravenous drip, giving 3000 c cm 4 per cent dextrose 0·18 per cent NaCl (one part of normal saline to four parts of 5 per cent dextrose) In addition, give normal saline in equal volume to the fluid withdrawn from the stomach This volume should be retrospective to the time the vomiting began

3 *After an operation such as excision of rectum or colon, when rectal fluids cannot be given, or retained*—Give intravenous fluids for two days If a blood transfusion has not been given, give 600 c cm of normal saline to cover blood lost, followed by 3000 c cm 4 per cent dextrose, 0·18 per cent. NaCl and, 3000 c cm the following day

1 *In a patient with established dehydration*—It has been shown by Coller and Maddock that patients who already show signs of dehydration have lost at least 6 per cent of their body-weight, a patient weighing 10 st has lost 3000 c cm The patient must receive this allowance of normal saline plus the usual daily fluid intake In a patient who is dehydrated from loss of saliva and diminished fluid intake, as in a carcinoma of the oesophagus, it is sufficient to give half normal saline This is true also in cases of pyloric stenosis

Our thanks are due to Prof J Paterson Ross in whose wards this work has been carried out, and to Dr G Graham and Prof R V Christie for their advice in the preparation of the paper

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"A modern industrial and democratic society, by reason of its economic complexity, cannot suffer it if it to become anarchical If it is not permitted to develop creatively into a Christian society it must become a totalitarian tyranny"—From "The Price of Leadership" by J Middleton Murry, London, 1939 Quoted in *Nature Lond* Aug 26 p 345

THIRD INTERNATIONAL NEUROLOGICAL CONGRESS

THIS congress was held at Copenhagen from Aug 21 to Aug. 25 under the presidency of Dr. Christiansen. Earlier in the summer there was some question of postponing the congress in view of the uncertain international situation, but it was finally decided to hold the congress as originally arranged. Crises considered, the attendance at the congress was remarkably good, although the contingent from Great Britain was smaller than it would have been in more settled times; it was however led by the president of the previous congress, Dr. Gordon Holmes.

The congress sessions were held in the University of Copenhagen and the opening was performed in the presence of H M. the King of Denmark and Iceland. The morning of the first day was devoted to a discussion on the *endocrine-vegetative system* with reference to neurology. Sir Henry Dale gave an account of the chemical transmission of the nerve impulse in the sympathetic and parasympathetic systems and at the end-plates of motor nerves J F. Fulton discussed the relationship between the endocrine glands and the vegetative nervous system. He mentioned the nervous connexion between the hypothalamus and the pituitary; through the pituitary hormones both thyroid and ovaries are also under the control of the central nervous system He developed the theme of varying levels in the nervous system for the integration of autonomic reflexes, the degree of complexity of the integration increasing at the more rostral levels, both the hypothalamic and cerebral cortex levels had important rôles in the control of the endocrines Laruelle of Brussels showed a series of beautiful histological preparations of the parts of the central nervous system which are anatomically connected with the autonomic system Further papers on related subjects were given by Gagel from Breslau and Forsberg from Oslo The afternoon was given over to short papers which had some connexion with the morning's theme, the most interesting being Macdonald Critchley's on disorders of nocturnal sleep in narcoleptics in which he added to the classical description of the narcolepsy-cataplexy syndrome a number of minor phenomena including feelings of semi-paralysis and hypnogogic hallucinations Symptoms of these types suggested that narcolepsy is a total disorganisation of the physiological mechanism of sleep.

The discussion on the second day was on a subject of less general interest to British neurologists, that of the *heredo-familial diseases*, especially from the genetic aspect The principal papers were by Bernard Sachs (this paper was read by Riley) on the relationship between amaurotic family idiocy and the other disorders of lipoid metabolism such as Niemann-Pick disease, by André Thomas of Paris on the hereditary cerebellar atrophies, by Curtius of Berlin and the Rumanians, Jonesco-Sisesti and Stroesco, on the genetic aspects of the problem; and by Schaffer of Budapest on the general pathology of hereditary nervous disease A film of congenital myotonia in goats was shown by G. L. Brown and A M Harvey from the Medical Research Council's institute at Hampstead and they also showed myograms demonstrating that the myotonic response to percussion persisted after complete denervation of the muscle and after curarisation, this indicated that myotonia was a property of the muscle-fibres themselves. A short paper which was based on a family studied at the National Hospital Queen Square, demonstrating that certain cases diagnosed in infancy as Oppenheim's disease were in reality examples of a congenital myopathy was read by J. W. Aldren Turner

There were no scientific discussions on the Wednesday, as the day was given over to expeditions to Elsinore and other places of interest in North Zeeland. On this day most of the British participants in the congress had to return to England for reasons connected more with psychiatry than neurology, and the account of the last two days of the congress is therefore not at first hand.

On the fourth day the congress divided into six sections concentrating on varying unrelated aspects of neurology In a paper on the *pathology of the cerebral astrocytomas*, Scherer of Antwerp pointed out the frequency with which parts of the tumours showed the structure of glioblastomas, a phenomenon which he did not think bore any relationship to the age of the tumour or to surgical intervention In the therapy section there was a communication by Madelaine Brown and J. H Talbott from Boston on the value of *potassium salts in Menière's syndrome;* they reported that several patients who had received no *benefit from dehydration had benefited considerably* from a high intake of potassium; since this form of treatment had been started at the Massachusetts General Hospital surgical intervention for Menière's syndrome had not been required.

In the section devoted to epilepsy, Lennox read a paper on the *electro-encephalographic records of relatives of epileptics* In a group of 110 parents or siblings of epileptics he found abnormal records in 51 per cent, this was nine times the incidence of abnormality in a normal control group. In 34 families both parents were examined and in 91 per cent at least one of the parents showed a definitely abnormal record. He concluded that electro-encephalography was a practical aid in the control of epilepsy by means of eugenics. A further paper by Lennox, on the *use of diphenyl hydantoin in epilepsy*, was based on the work of Merritt and Putnam from Boston, they concluded that it was of considerable value in cases of grand mal and psychomotor seizures which were not relieved by phenobarbitone, and, surprisingly enough, found that few patients were intolerant and no serious complications had occurred.

In the neurological surgery section papers were given by Mixter on *rupture of the lower lumbar intervertebral discs*, by Oljenick on *occipitation of the atlas and its clinical syndrome* and by Olivecrona on the *treatment of acoustic neuromas*

The last day was given over to a symposium on neurological results of the *avitaminoses* especially in the peripheral nervous system. The rôle of vitamin-B_1-lack in the ætiology of polyneuritis, and of nicotinic acid in the production of pellagra were the subjects most discussed. Wechsler from New York gave a comprehensive account of the relationship between B_1-deficiency and peripheral neuritis; he objected to the word neuritis on the ground that there was no evidence of inflammation: instead he wished to introduce the term polyneuropathy for polyneuritis in which vitamin-lack or any other non-infective agent seemed to be responsible He placed a large and mixed collection of types of polyneuritis in the deficiency class; thus he thought that neuritis associated with arsenic, diabetes and even phosphorus might have avitaminosis as an additional and possibly ultimately determining factor. He suggested that not only B_1 but the rest of the B complex, and even vitamins A, C, and D might be of importance for the nutrition of the central and peripheral nervous system Ungley's paper described a number of cases

of polyneuritis, some of them associated with gastro intestinal lesions, which appeared to be due to deficiency of vitamin B, while Teglbjaerg from Denmark discussed the treatment of nervous disease with vitamins, he pointed out that chronic nervous changes may result from avitaminosis, but are irreversible in spite of treatment with large doses of the essential vitamins

Sir Edward Mellanby's communication dealt especially with the effects of lack of vitamin A on the nervous system, many of the degenerative lesions found both in the spinal cord and peripheral nerves in experimental animals, which were previously thought to be due specifically to lack of the vitamin, were in fact due to overgrowth of bone causing pressure on the nerves and cord It had not been decided yet whether this bony overgrowth was the only factor causing the changes in the nervous system Unfortunately an important paper from the Oxford school by H M Sinclair could not be given This worker has tried to get objective evidence of vitamin B_1 lack in neurological conditions by estimating the amounts present in the blood both of total vitamin B_1 and of its phosphorylated form or cocarboxylase Such work is a valuable addition to clinical studies on the subject

As well as the scientific discussions, there were the usual social accompaniments of a medical congress, including an evening reception given by the city of Copenhagen in the town hall

THE BASTARDY (BLOOD TESTS) BILL

REPORT OF THE SELECT COMMITTEE OF THE HOUSE OF LORDS

LAST December Lord Merthyr introduced in the House of Lords a bill to enable courts of summary jurisdiction to order blood group tests to be made in bastardy cases The bill provided that when either party demanded a blood test the court should be obliged to order it, and that if the woman refused her application should be dismissed The test should be done by a registered medical practitioner approved by the Lord Chancellor To save expense his report should be admitted as evidence of the facts contained in it, but he could be called as a witness by the court or either party Whether the man was excluded by the result of the test from suspicion of paternity or not, the report should be before the court, but if it was inconclusive no comment on it should be allowed In the discretion of the court, costs should be payable out of the funds which are at the disposal of local authorities for the defence of poor prisoners The Lord Chancellor would be given power to make rules governing the whole of the legal and serological procedure, and he would be assisted in this task by an expert advisory body consisting of legal and medical members

The bill was given a second reading in February and was referred to a select committee of the Lords This is often done when a bill contains new and controversial proposals The committee is usually eight or ten strong and has power to summon witnesses, it is assisted by the legal advisers of the Government The present committee was presided over by Lord Strathcona and Mount Royal and included in its personnel Viscount Dawson of Penn and the Bishop of Salisbury The committee held several sittings during the summer and examined magistrates barristers solicitors pathologists and others Its report was published on Aug 18

NEED FOR THE TESTS

The committee declared that it was unanimously of opinion that the qualities of blood underlying blood grouping, and the laws of inheritance governing the transmission of these qualities from parents to children, are accepted by such a consensus of scientific opinion throughout the civilised world as to render it desirable in the interests of justice for this knowledge to be applicable to affiliation cases It made certain amendments in the bill as originally drafted, and recommended that the amended bill should be passed into law Although the tests can only exclude paternity in about one case in three where the man is innocent, the committee agreed with the Home Office that nevertheless the tests might prevent an injustice being done in these cases, and any method which reduces the number of cases in which the courts may make mistakes must be welcomed The committee was satisfied that the risk of error in the making of blood tests has been reduced to negligible proportions, and that the tests not only might but would prevent injustice It noted that the public are becoming ready to accept the positive verdict of science when it declares that a man cannot be the father of a particular child

The committee was much impressed by the fact that the preponderance of medical and legal opinion was emphatically in favour of the use of blood-tests as evidence in affiliation cases, also that the testimony of two out of three critics of the bill, though of value and interest as regards bastardy law in general, was not directed against the validity of blood tests as evidence and was largely irrelevant to the purpose of the bill Mr Dunne, a stipendiary magistrate, who was strongly in sympathy with the main object of the bill, urged that these are civil cases and that to make it mandatory on the court to order a blood test would be an interference with "the liberty of the subject", and that a mother would have some justification for objecting to the taking of blood either from herself or from her child The committee felt that although these cases are technically civil, yet they require special treatment in view of the social repercussions and possible injury to reputation they involve It did not think that too much weight should be attached to the suggested interference with "the liberty of the subject" if the tests can be carried out under conditions which would admit of no doubt as to the validity of the results An attempt was made by two non medical witnesses representing the National Council for the Unmarried Mother and Her Child, to prove that science is not yet sufficiently advanced to justify the use of blood tests in court The committee was more impressed by the unanimously favourable testimony of the eminent pathologists who gave evidence, and saw no alternative to accepting the conclusion that blood tests carried out by approved experts would render reliable and valuable assistance to the courts in affiliation cases

LEGAL PROBLEMS OF THE BILL

The committee concluded that when a blood test is demanded by the man, the court should be obliged to order it and that in other cases it should have discretion to do so It had also to consider whether there should be any exceptions to the rule that the refusal of the woman should bring about the dismissal of her application As the responsibility of taking the blood samples would invariably rest with a qualified medical practitioner, they concluded that no cognisance need be taken of the very exceptional

cases, such as the presence of hæmophilia, in which the taking of blood might be detrimental to health.

If the bill became law it would not be of much use unless it made some provision for paying the expenses out of public funds, for most of the parties are poor. Certain witnesses pointed out that to impose such costs upon the local funds would not only be a burden on the rates, to which the county councils strongly object, but would also introduce an extension of legal practice The balance of the evidence was, however, in favour of the charge being imposed on the local funds, and with this view the committee was in complete agreement. It dealt at some length in the report with the probable cost of blood-tests, and did not think it likely that the cost to a local authority in any one year could amount to more than £170—an insignificant amount in view of the large funds handled by these bodies. There would also, it remarked, be some saving to public funds in a reduction of the number of poor defendants sent to prison for default It might justly have suggested that the existence in law of the bill would probably cause a considerable reduction in the number of bastardy applications.

The committee therefore decided that blood-tests, within their own domain, should be sufficient evidence of the facts shown thereby, unless the pathologist should have attended the court at the instance of the court or of a party, in which case he would be liable to cross-examination The court should have discretion to demand security for costs, and to order the payment by either party or out of the local funds of the costs not only of the test but also of the attendance in court of the pathologist. These provisions were in the bill as drafted.

DETAILS OF PROCEDURE

A very difficult practical problem with which the committee was confronted was the question of the rules to be made by the Lord Chancellor governing the procedure and the composition of the advisory body The committee considered different suggestions for the composition of this body, made by Mr. D. H Kitchin, Dr G Roche Lynch and Dr. S C. Dyke It concluded that Mr. Kitchin's was the best and, subject to the agreement of the Lord Chancellor, recommended that it be adopted This plan provides for a board consisting of ten members, five legal and five medical, the legal members to be nominated by the Lord Chancellor and the professional bodies, and the medical members by the three Royal Colleges, the Medical Research Council and the British Medical Association A set of suggested draft rules was submitted to the committee and is appended to its proceedings: these contain a detailed scheme for the approval of pathologists and testing centres and for the taking, testing and identification of samples

The committee recommended that there should be two approved testing centres with the prospect of increasing them to four if required Provision should be made for blood samples to be taken by a registered medical practitioner, who should if possible be the woman's regular medical attendant. It recommended that the court should not have power to order a new test, but that on appeal the court of quarter sessions, though not a divisional court or other appellate court, should have power both to take into account the test produced to the lower court and to order a second test if it thinks fit This power for quarter sessions to order a test is a valuable addition to the bill as drafted, but its denial to the divisional court is rather puzzling; judges of the King's Bench Division would be hardly likely to misuse it. The question was raised whether in any circumstances the approved person should be compelled to submit his test to another pathologist for confirmation. It was pointed out that this compulsion might give rise to doubts as to the validity of tests in general. The committee was satisfied that a single test is sufficient and that it is unnecessary to impose confirmation as a duty.

The committee accepted the opinion of the majority of the pathologists that the blood samples should be forwarded untreated and not diluted with a preservative It was satisfied that a standardised system of identification by means of coloured test-tubes would make the risk of error negligible, and that samples sent by post in strong wooden containers would arrive in good condition. Finally, it recommended that the child and its mother should always be required to appear together to undergo the test.

HEALTH IN FACTORIES

FACTORY work is, thanks to sane industrial legislation, becoming steadily more safe. Dr J C. Bridge, senior medical inspector of the Home Office, has a similar story to tell with regard to the health of the factory worker in his section of the annual report of the Chief Inspector of Factories[1] for 1938. Parts of the Factories Act, 1937, deal with general health, and employers have been very willing to conform with them.

The eye-protection provisions have been greatly extended but the cry still goes up that workers refuse to wear goggles. In one large ophthalmic hospital in London the education of workers is attempted by an exhibition of eye-protection appliances, it seems unfortunate that the lesson should be learned only after an eye injury has occurred.

The number of cases of *lead poisoning* has fallen from 141 in 1937 to 96 in 1938; whereas in 1900 the number was well over 1000, it is now for the first time under 100, in spite of the fact that since 1927 building-painters have been included in the figures It was sometimes found that lead paint was being applied by means of a spray, but after the danger was pointed out the brush method was substituted. Leadless paints also are being used more and more. Two cases of *mercurial poisoning* were reported, one in a thermometer-maker and the other in an electric-metermaker.

Of the nine cases of *aniline poisoning* four were unusually severe (aniline oil caused two of them, paranitrochlorbenzol vapour the third and para-toluidine for the fourth). The remaining five cases were slight and were brought about by contact with trinitrotoluol in a shell-filling factory No cases of chronic *benzene poisoning* were reported during the year, but investigation of a boy with leucopenia engaged as a cellulose sprayer showed that he had been using for 14 weeks two cellulose solutions, one of which contained toluene and the other 30 per cent. of benzene

Toxic jaundice is a portmanteau term; of the four cases notified during the year three occurred in a chemical works and were due to arseniuretted hydrogen and the fourth was caused by trinitrotoluene in a shell-filling factory One of these cases of arsine poisoning presented a difficult problem, apart from a slight lemon-yellow tinge of the skin of the face, there was no evidence of jaundice, and death occurred within two days of exposure, as compared with the usual average of five days. Dr. Bridge remarks that

1. Cmd. 6081. H M Stationery Office Pp. 133 1939 2s.

he had not previously seen arseniuretted hydrogen poisoning without definite jaundice, but the post-mortem examination, which was not performed until five days after death, revealed no sign of decomposition, the cheeks and nose were bright pink in colour and arsenic was detected chemically in the various organs Three other fatal cases of jaundice were investigated and in these there had been exposure to fumes from chlorinated naphthalene wax, a substance which is known to cause a skin affection called "wax rash" or "chlor acne" Two of the fatal cases had this condition as well as jaundice The third, a girl aged 21, had been employed at a radio works for nine months, three feet away from where the wax was being melted in small shallow electrically heated trays Slight malaise for two weeks preceded the onset of jaundice After treatment at home for a fortnight she was removed to hospital where she died two days after admission Of 6 other women who worked in the same department, 2 were found to have suffered from jaundice, and 3 others complained of nausea, dizziness and drowsiness Blood-tests to exclude Weil's disease were in each case negative The precautionary measures to suppress the fume consisted in regulating the temperature of the wax pots, covering them, and applying exhaust ventilation

An increase in *anthrax* occurred during 1938, there being 34 cases with 5 deaths as compared with 23 with 4 deaths in 1937 Dr Bridge comments that a satisfactory method of disinfection of hides and skins is yet to be found The dust from wool (shoddy) is used as a soil fertilizer, and one case of anthrax occurred in a factory where shoddy was handled, in another factory where two cases occurred, the only possible source was found to be bone meal obtained by grinding in India of sun dried and unsterilised bone Another case occurred in a builder's labourer, employed in mixing mortar with hair from goat skins fellmongered in this country and therefore not coming under the Order in Council as regards disinfection In the five fatal cases treatment was delayed by failure to obtain medical attention or in correct diagnosis, and Dr Bridge emphasises the value of supplying workers in dangerous processes with the small official anthrax card (Form 1803) This card is shown by the worker to his doctor, who is thus reminded to think of anthrax and delay in treatment is thereby prevented

An increase in *chrome ulceration* (115 in 1938, 14 more than in 1937) took place thanks to the use of anodic oxidation in aircraft production *Occupational cancer* still continues Pitch and tar were the carcinogenic agents in 103 cases with 8 deaths, and paraffin or shale oil in 62 cases with 13 deaths Of the pitch and tar cases, 23 came from patent fuel works, 57 from tar distilling plants, 11 from gasworks and 12 from other industries, the majority (58) of the mineral oil cases occurred in cotton mule spinning and only 4 in other industries At a nickel works 4 more cases of cancer have occurred, 2 of the nose and 2 of the lung

Most of the reported cases of *gassing* were due to carbon monoxide Men working with blast furnaces tend apparently to take unnecessary risks, in 10 cases, of which 5 were fatal, gassing took place during attempted rescue of others

There were 430 deaths from *silicosis* and 9 from *asbestosis* in 1938 Efforts are being made to find efficient substitutes Examples include the use of alumina for flint in china bedding and for siliceous material in the parting powders used in foundries, of non siliceous abrasives for sand or flint in blasting, and of non-siliceous material for kieselguhr (used in the slow cooling of steel) and for silica bricks (for lining steel or other furnaces)

The list of causative agents of dermatitis appears to be unlimited and new items have to be added each year Two cases in 1938 were due to ultramarine In each case the length of exposure was four years A series of 25 cases of dermatitis on the hands and arms of girls employed in canning carrots was investigated There is little doubt that the carrot juice was the primary causative factor Experiments showed that a positive patch test could be obtained with certain extracts of carrot The spread of infection by roller towels is generally held to be a remote risk but Dr Bridge describes an outbreak in a factory of an infective skin condition which was thought to be spread by the use of communal towels The firm was advised to suspend from work all persons suffering from the acute infection, to substitute individual paper towels for the roller towels, and to have the wash basins regularly disinfected These precautions were put into operation and no further case has occurred in the factory

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

BLOOD TRANSFUSION SERVICE

THE appeal for 25,000 donors for this service is meeting with a slow but steady response The service is open to all healthy men and women between the ages of 18 and 60 and people who are already engaged in other emergency services are permitted to enrol as donors Early last week over 200 of the required 1500 had volunteered in Aberdeen and in Edinburgh over 300 out of 5000 In Glasgow the figures were slightly better Blood banks have been started in the main centres of population The main organisation centres are Edinburgh J R Copland, 22 Gilmore Place, Glasgow, Town Clerk's Office, City Chambers, Dundee, Royal Infirmary, Aberdeen, Public Health Offices, 4 Albyn Place In addition to these centres, prospective donors may apply to any local hospital, and the profession in Scotland is asked to encourage members of the public to volunteer

NEW PROFESSOR IN ABERDEEN

His numerous friends in Edinburgh and elsewhere are delighted at the appointment of Mr W C Wilson, F R C S I, to the regius chair of surgery in the University of Aberdeen This appointment is, of course, consequent upon the resignation of Prof J R Learmonth, who is succeeding Sir David Wilkie in Edinburgh Mr Wilson is well known for his work as a children's surgeon and for his research work on burns and on many physiological problems, notably in relation to the nervous system and the humoral transmission of nerve impulses He is a prominent member of the group of surgeons who believe that research in pure and applied physiology constitutes the most useful field for the advancement of surgical and general medical knowledge As a worker in and lately as director of, the surgical research laboratory in Edinburgh University and as director of the surgical research unit in the Edinburgh Royal Infirmary, he has brought honour to the Edinburgh medical school Edinburgh's loss will be Aberdeen's gain This is the third exchange which has taken place between these two Scottish schools within a year

PUBLIC HEALTH

EPIDEMICS IN RECEPTION AREAS

THERE are two distinct epidemiological dangers in reception areas. First, the evacuated children may introduce disease among the less immune natives: secondly, the rural conditions may expose the evacuated children themselves to infections from which they are not immune The dangers to the native children are primarily diphtheria, scarlet fever and streptococcal throats, measles, whooping-cough and other fevers which may not have been prevalent in their area for some time Further in rural districts there is the danger of water-borne infection by carriers among the evacuated children. The evacuated children themselves may be assumed to possess more immunity to the usual children's fevers than the natives For them the main risks are water-borne and milk-borne diseases to which they are not immune

The main water-borne risks are fevers of the enteric group and the bacillary dysenteries Both these may also be spread by milk, as may be scarlet fever, diphtheria, undulant fever and tuberculosis. In urban areas much of the milk is pasteurised, in rural areas very little Therefore immunity from milk-borne diseases must be assumed to be rare among the evacuated children Certain general precautions may be recommended. Where water is not piped, it should be boiled before being drunk All unpasteurised milk should be boiled. Where sewage is not piped, it should be disposed of well away from, and if possible on a lower level than, wells. Children unused to the earth-closet should be warned to take simple precautions against contaminating the soil Those in charge of evacuated children have their hands well filled and the imposition of these additional labours will not be welcomed But should typhoid, dysentery or any other milk- or water-borne epidemic break out, the difficulties of treatment will be considerable Isolation hospitals in rural areas are usually small and not easy to get at Ambulances will be wanted for other purposes and home nursing will be more trying than in normal times

In the past two years THE LANCET has published a series of articles on the control of the common fevers It is felt worth while to summarise the main points made by this group of expert contributors

ENTERIC FEVER

Season September–November. *Incubation period* 14 (7–21) days *Second attacks* rare. Enteric is spread mainly by milk and water and occasionally by insect vectors It is prevented by the proper disposal of sewage, the detection of carriers, the boiling of water and the pasteurising or boiling of milk

Active immunisation—T A B. vaccine given at intervals of 7–10 days (two to three doses) gives considerable protection, which is maximal soon after the last dose. Ideally it should be given in the absence of an epidemic In the face of an epidemic inoculation does improve the chances if the subject is not already infected, but if infection is already present, the typhoid is likely to be worse—the so-called "provocative" typhoid In a rural area vaccination of contacts will do more good than harm in spite of the risk of provocative typhoid. In an urban area with a temporary and remediable breakdown of water-supply, vaccination of the potentially infected is not advised, since the chances of provocative typhoid are considerable and the immunisation gained is not in time to help Antityphoid serum may be given to contacts in two doses at 14-day intervals, thus ensuring some protection for six weeks or more. The practical value of this is, however, small (Topley 1938)

SCARLET FEVER AND STREPTOCOCCAL INFECTIONS

For scarlet fever, *season* September–November. *Incubation period*. 3 (2–4) days *Isolation period* 6 weeks (4 weeks if mild) *Quarantine period* for contacts: 10 days *Second attacks* rare The chief methods of spread of scarlet fever and other streptococcal infections are by direct contact between individuals (including nurses and doctors) who are not necessarily ill Occasionally milk is infected from a human carrier and streptococci have been found on toys and fomites. In institutions, contacts may be Dick-tested and temporary passive immunity established with 5–10 c cm of antitoxin Outside institutions, the clinical and bacteriological detection of carriers is seldom practicable, unless they are prematurely discharged patients, with running ears or other foci of infection. Children sleeping in dormitories should have their beds placed alternately feet to head, so as to increase the distance between the sources of droplet spray. The liability of the streptococcus to produce either scarlet fever or sore-throat must be remembered (Allison 1938)

BACILLARY DYSENTERY

Season. Summer and autumn. *Incubation period*. 4 (1–7) days As a mild gastro-enteritis, bacillary dysentery is much more common in England than is generally recognised It can often be diagnosed only by very early bacteriological examination of the stools, and it has to be distinguished from food poisoning due to salmonella organisms and toxins Large epidemics are rare When they do occur they are usually due to massive infection of water or milk Sporadic outbreaks in family groups are more usual. The condition is often endemic in children's wards and mental hospitals Chronic carriers are probably only important in institutions. In the outside world spread is almost always from case to case, though often some of the cases may be so mild as to escape medical attention The contamination of food, cooking utensils, milk and water may occur from the hands of sufferers

The types commonly met with in England are those due to the Flexner organism (causing dysentery of moderate severity), and those due to the Sonne group (mostly mild cases) Shiga outbreaks are always imported from abroad and are therefore rare. They are the most severe, and serum is only worth using therapeutically in such outbreaks

Apart from general measures of control for water and milk, the most important steps to check an epidemic are isolation of the patient whenever practicable and nursing under strict conditions, the stools being treated as are enteric stools Such isolation may be stopped after one week of well-formed stools In deciding when to stop isolation, it is useless to rely on bacteriological tests of stools, as negative tests are of no significance.

No standard method of vaccine prophylaxis has yet been worked out, though vaccines have been used with considerable success. A suitable vaccine contains 150 million each of the five common Shiga types of organism, and the same number of Sonne strains per ml The Sonne strains must have been recently isolated and not subcultured too frequently The dose for such a vaccine is 0·5–1 ml according to age, and is best given subcutaneously. In institutions inoculation should be carried out once a year (W. M. Scott 1938).

DIPHTHERIA

Season: September–November (worse in dry years). *Incubation period*. 3 (1–4) days. *Isolation period*.

SEROLOGICAL CONTROL OF MEASLES

Nature of serum	Dose in c.cm	Dosage factor	For prophylaxis		For treatment
			Protection	Attenuation	
Convalescent	5–20	Age × 2	1st–5th day after exposure	5th–9th day	Within 6 days of onset of disease
Normal adult	10–40	Age × 1	1st–3rd day	3rd–9th day	Dosage factor age × 4
Whole blood	Double serum	Age × 4			Route intravenous
Placental extract	7·5–30	Age × 3			

4 weeks *Quarantine period* 12 days *Second attacks* may occur Hospitalisation of most, if not all, cases of diphtheria has been the practice in this country for many years This however does not diminish the incidence of the disease Spread is from patients and carriers, who may be convalescent or healthy, and the organisms may pass by droplet spray or by milk to the patient The most dangerous source of infection is not the occult carrier but the child with an overt blood stained yellowish nasal discharge It is possible and indeed probable that a number of such children are among those evacuated

Immunisation has been going on slowly in many urban districts, but is rare in rural districts In 1937 Chester headed the list with 45 per cent of its child population immunised Birmingham, Walsall Worcester, Leeds, Manchester and Chatham were in the 35–40 per cent. group The London boroughs vary greatly Acton in 1937 led with 30 per cent, but the average was only 5·3 per cent

The *prophylactic* method of choice is probably the alum precipitated toxoid (A P T) One may give 0·2 c.cm followed four weeks later by 0·4 c.cm of A P T The minimal interval between the two doses is two weeks. One injection alone is of little value The results should always be checked if possible by the Schick test Passive immunisation by the injection of 1000–2000 units of antitoxin will protect exposed children for three weeks It is best to precede this by a Schick test It may be followed immediately by active immunisation but A P T or formol toxoid (F T) should be used as these contain no horse serum Diagnosis must not wait upon a bacteriological report The tellurite test has a high percentage of error and should therefore not be used Treatment should begin the moment a clinical diagnosis is made Active immunisation has been said to increase the number of carriers (by preventing some of these from developing the disease) and thus to increase the risk of infection in the unprotected The evidence on which this statement is based is doubtful and the immunisation of nurses in fever hospitals has not increased their carrier-rate (E. H. R. Harries 1939)

WHOOPING-COUGH

Season Spring and autumn *Incubation period* 14 (7–21) days *Isolation period* 4 weeks if quite fit at the end of that time—even if still whooping (some authorities still recommend 6 weeks) *Quarantine period* 3 weeks *Second attacks* never occur Whooping cough shows a biennial periodicity alternating with measles This year in England whooping-cough is likely to be severe In its treatment vaccines are useless and convalescent serum of little value It is most dangerous in children under two years of age, and in a family where one case occurs it is worth while to give any other children under two years 10–20 c.cm of parental blood intramuscularly thus producing a temporary immunity Prophylactic immunisation with a vaccine is not yet really in the sphere of practical politics It will definitely attenuate attacks (a valuable hygienic measure in as much as permanent immunity is then ensured) but it will not prevent attacks (Cruickshank 1938)

CEREBROSPINAL FEVER

Season Winter and spring *Incubation period* 4 days In this condition carriers are probably extremely common but susceptibles rare Epidemics are only likely to occur in crowded quarters such as barracks The best prophylactic measure so far known, apart from the proper ventilation of sleeping quarters, is for all in contact with a case to gargle with 1 1000 potassium permanganate Treatment is now a question of chemotherapy

POLIOMYELITIS

Season August–September *Isolation period* 6 weeks. *Quarantine period* 3 weeks Epidemiologically poliomyelitis is somewhat similar to cerebrospinal fever, that is to say, carriers are common but susceptibles are rare Child contacts are more dangerous than adult carriers Isolation of patients and contacts is the only effective control measure. Where the school is the only meeting place for children, as in very scattered rural areas, closing the school is said to be of value The case for closing residential schools is still debated If the children are dispersed, they must go into quarantine Treatment with convalescent serum is of small value only, and vaccines for active immunisation are useless (MacNalty 1938)

MEASLES

Season December–January, and May–June *Incubation period* 14 days *Isolation period* 10 (9–14) days *Quarantine period* 16 days Measles in England shows a biennial periodicity and 1939 is not a measles year Treatment with immune convalescent serum in doses of 10–50 c.cm has been used, but its value is not proved In prophylaxis isolation alone is useless Immune serum will give complete protection for 14–21 days It is specially indicated for children under three years of age and in patients exposed to infection and already suffering from some other disease in whom measles might prove very dangerous In general attenuation with normal adult serum is the ideal to be aimed at The intramuscular dosage with the different varieties of serum and blood, and the results, are shown in the table above (Gunn 1938)

UNDULANT FEVER

Incubation period 14 days. Not less than half the herds in this country are infected with the *Brucella abortus* The condition is twice as common in males as in females and is uncommon in children Infection is always from cattle either by direct handling or via milk or milk products Pasteurisation or boiling definitely makes milk safe, tuberculin tested milk is not safe (Dalrymple Champneys 1938)

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GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM D.P.M.

II

AMONG the compensations of middle age is the fun of watching one's contemporaries turn into their parents I can remember thinking, when I was a child, that my friend's parents were acts of God. I could not imagine them younger or older; they were portents as ageless as the pyramids and rather less explicable That they had begun differently and grown to that pattern never once occurred to me; I must have been a dumb child. Nowadays I can watch them being created before my eyes; and though I find it pleasant, it alarms me because I know I am undergoing the same process To be so constantly aware of the change is disconcerting: it makes one feel unreal and ephemeral on the one hand, and permanent and indestructible on the other. It lends point to the remark of the geneticist that a hen is simply the device of an egg for producing another egg, but robs it of any sting; for obviously the device has a more amusing time than the egg

One sign of maturity which I detect in my friends and myself is a taste for gardening. As far as my experience goes, gardening is not particularly popular with the young—possibly because the gardens in which they are invited to spend their energy are seldom their own Anyhow, I can recall being irritated by the sight of my parents pottering round the garden, and I remember turning sulky when I was asked to help; and now I am among the potterers and getting grimier in the nail-beds as the years go by The other day a young man told me in an angry voice that his parents thought of nothing but their garden, and I looked at him commiseratingly The mark of the potterer is on his brow; in another fifteen years, Hitler permitting, he will be out among the bean-rows, I expect.

* * *

How is it that experts in occupation therapy have made no particular use of dramatic performances as treatment? To prepare and perform a play is a highly social activity, everyone is involved on more or less equal terms, and with a little organisation everyone can be given as much to do as he will stomach. Scenery, lighting, costumes and stage-management can be trusted to keep any number busy, the musical programme will usually provide a full-time job for anyone with a trace of talent; and the acting itself is a gift to the psychotherapist Young things who fancy the world against them can release much of their self-pity in a sympathetic part; those who never attract notice can be sure of the attention and applause of a roomful of people; and the unattractive clumsy one, guided by a skilful producer, can win the affection of the whole house as a comedian. Add to this the pleasant touch of excitement which clings about the theatre and you have the perfect atmosphere for restoring and maintaining mental health In fact after one or two productions probably the only person in need of psychotherapy will be the producer; but in the combined cause of art and science who would not sacrifice a producer or two?

Gas masks for children between the ages of two and five, I am told, are decorated with pictures of Mickey Mouse What a civilisation! German infants, presumably, would see through such hollow entertainment; judging by Clare Leiser's "Nazi Nuggets," quoted in last week's *New Statesman*, Mickey has lost his public in Germany: "Mickey Mouse is the most miserable ideal ever revealed . . Healthy emotions tell every independent young man and every honourable youth that the dirty and filth-covered vermin, the greatest bacteria carrier in the animal kingdom, cannot be the ideal type of animal" However, I can't help feeling that there are German babies who disappoint their preceptors in this, and continue to find the gallant and resourceful Mickey as attractive as the brave little tailor of their own fairy tales.

Until recently I had the impression that most people in this country were kindly disposed towards the German people, as distinct from their leaders and political system, but a night or two ago, happening to remark that it was agreeable not to have to feel rancour towards the Germans themselves this time, I was depressed to find that hardly anyone agreed with me The room was full of young people who no doubt were justified in resenting bitterly the overthrow of their future; but it was saddening all the same to hear the ghostly phrases of 1914 echoing through their conversation—"no peace until they are stamped out"—"break Germany up"—"all the young people in Germany are longing for war"—"root and branch." The Prime Minister has told us, with splendid discrimination, the evils we are fighting: brute force, bad faith, injustice, oppression and persecution He is right, those are the things we want to destroy—if we can find a way to hit the target Unfortunately, as in all wars, we shall be fighting many who hate these things as much as we do, the few who uphold them will be shielded by armies of just and honest men If we can keep this in mind we shall do a little better than we did last time Once or twice in the last few days I have found myself thinking of a remark which Sir James Barrie once made to the students of Edinburgh University, a great remark in my opinion. I quote it from memory, and probably inaccurately: "Do not attribute to your enemy motives meaner than your own. Nothing so debases the moral currency Give it up and be great."

* * *

The trouble about this war, or so I think after five hours of it, is that it is too well organised There is none of the haphazard, go-as-you-please atmosphere which I seem to recall in 1914, with the theatres playing to crowded houses and everyone feeling brisk and disorderly. Perhaps this, being a Sunday war, is bound to have some of the atmosphere of the traditional English Sunday; or perhaps I see the last war—"The War," as we used to call it in our innocent way—through a golden haze However, I am not really qualified to give an opinion because I find on thinking it over that nearly all my memories of the last war are gastronomic True, I was a growing child at the time, if that can be regarded as an excuse, but it had not occurred to me before what

a greedy one I must have been The thought of returning to the diet of those days hardly troubles me now, perhaps my soul no longer resides in my pylorus, though I have no evidence of its taking up any other situation It will even be amusing in a way to see the old menu cropping up again That indefatigable codfish, for example, is he still waiting to lay down his life for us, pale, flaccid, slippery, and tasting of wet cotton wool? Shall we see that queer substance honey-butter replace jam? Will sugar mysteriously convert itself to saccharine, and the hens give up laying as a protest against the European situation? Will potatoes turn hard, blackish and semi translucent, like rather grubby candle grease? Worst of all, must we again face rice pudding made with dried milk? That pudding really excites my indignation, even in retrospect I can remember air-raids too, but without acrimony For some reason that rice pudding will stick in my gizzard till I die

OBITUARY

ARTHUR LAUNCELOT FLEMMING

M B BRIST, M R C S, D A

Dr Flemming's death last week at his home at Clifton will be keenly felt in Bristol, where he did so much for the teaching and proper establishment of anæsthetics at the Royal Infirmary The son of a Freshford practitioner, he went to school at Somerset College and Hermitage House, Bath, going on to Bristol University and medical school After taking his M R C S in 1894 he held resident appointments until he was attracted to the war in South Africa, where he became surgeon to the Princess Christian Hospital Returning to Bristol for his degree in 1910 he began to specialise in anæsthetics and was registrar and anæsthetist first at the women's and homœopathic hospitals, later at the orthopædic hospital, and finally at the infirmary He was also well known to London anæsthetists as an assiduous attender of the sectional meetings of the Royal Society of Medicine, he was president of the section of anæsthetics 1922–24 He also played a part in the formation of the Association of Anæsthetists, serving on its first elected council He was a sound rather than a profuse writer on professional topics and had a literary sense which served him well as editorial secretary for many years to the *Bristol Medico Chirurgical Journal* He was president of the Bristol Medico Chirurgical Society 1926–27 All who knew him were impressed with his directness and sincerity

JOHN GRAY

M D EDIN

Dr John Gray reader in pathology at the British Postgraduate Medical School at Hammersmith, died last week in his fortieth year He had been in failing health for two years and the end was not unexpected None the less, his death comes as a loss not alone to pathological teaching and research but to a wide circle of friends Gray came from Edinburgh, where he attended George Heriot's school, serving as a private in the Highland Light Infantry in 1918 He then had a brilliant career in Edinburgh University, taking first place in almost every subject and the Cunningham, Vans Dunlop, Murchison and Stark scholarships After graduating in 1923 he held the Allan fellowship in clinical medicine and surgery, assisted in the anatomy department and did some research on the embryology of the pituitary gland He was then house physician to the Royal Infirmary and in 1925 passed from there to Aberdeen as senior assistant in pathology and later lecturer, holding concurrently the Leckie Mactier fellowship awarded him by Edinburgh In 1927 he took his Edinburgh M D with gold medal for a thesis on nephritis and six years later, at the request of the Medical Research Council, he expanded this thesis into a monograph which was published as Special Report (1933) No 178 The establishment of the radium centre enabled him to study the histological effects of irradiation on malignant growths and diseased tissues, his studies included hypernephroma, endothelioma, rhabdomyoma and peri arteritis nodosa In Aberdeen it was his duty to report to the hospitals on all autopsies, these numbered well over a thousand during his period of office, and he had a good deal of medico legal work to do on behalf of the procurator fiscal It was in 1934 that he left Aberdeen for Hammersmith with the reputation of a lucid and informed lecturer, there he helped to create the liaison between clinician and laboratory staff by organised discussions which were something new and highly satisfying in medical teaching The regard in which he was held was heightened by his modest bearing and the easy way in which he carried his learning

CHARLES HEWITT MILLER

C B E, M D CAMB, F R C P

THOUGH he left the London Hospital in 1925, Dr Miller was very much a London Hospital man Educated first at Rugby and Trinity College, Cambridge, he qualified in 1901, and after holding many house appointments at the London acted as director of the pathological institute there from 1905 to 1907 He did not want to become a pathologist and he joined the staff of the Victoria Hospital for Children in 1906, the Metropolitan Hospital in 1909 and the Brompton Hospital in 1912 But his clinical medicine was founded, more than most men's, on observation in the post-mortem room and he carried into practice the painstaking method of the morbid anatomist Since failure to observe is the usual cause of failure in diagnosis, he was a good diagnostician, and his habit of carefulness was transmitted to his students It seemed to them—as indeed it was—part of the hospital tradition

In 1913 Miller was appointed assistant physician to the London, and when the late war came he saw distinguished service, he ended the war as a full colonel, having been consulting physician to the British Expeditionary Force and twice mentioned in despatches After demobilisation he was created C B E Meanwhile he had been elected F R C P in 1916 and in the following year had delivered Goulstonian lectures on the paratyphoid infections which may be read in our columns On Jan 19, 1920, he took charge of the

newly established medical unit at the London Hospital, and as first director served nearly five years He was an exacting teacher, a stickler for thoroughness in clinical examination, never hurried and intolerant of slackness. But if he was sometimes impatient with his clerks he was never impatient with the sick. A big heavily built man, with a somewhat heavy clean-shaven face and a slow manner, he was gentle in his approach and sensitive in mind.

His writings were not many. He was especially interested in peptic ulcer and its consequences, and in the relationship between the gall-bladder and cardiac pain. In this last indeed he took a very personal interest, for it was an attack of coronary thrombosis, and the ill health that followed, that made him give up his busy consulting practice. In a letter to THE LANCET in August, 1934, signed "Live and Learn," he gave an account of this attack, of how eighteen months later he decided to start practice somewhere else on a more leisurely plan, and of how he gradually regained power to do almost anything he liked, from ski-running to salmon-fishing. This letter, like one or two others it inspired, is full of useful information for anyone with cardiac pain, and it has the charm of sincerity and self-revelation.

The place Dr. Miller chose for his new practice "on a lower level of action" was Exeter, where he was appointed to the staff of the Royal Devon and Exeter Hospital. "It was not long," writes a Devon practitioner, "before he was in great demand as a second opinion. His wide knowledge of medicine, his simplicity and his great good sense came as a breath of fresh air to those of us who called him in to help with our problems It was felt that, if anybody could clarify a situation, he could; and his therapeutic suggestions were always practicable and never complicated. His lectures to the Devon and Exeter Medico-Chirurgical Society and his remarks during discussions on cases were conspicuous for sanity and he never used a long word where a short one would serve the purpose"

The last phase of Miller's career began with his appointment in 1937 to the staff of University College Hospital, where approaching retirements were likely to leave the physicians a group of unusually young men. Here it was his primary task to fill a gap, but he did much more.

Dr. Miller died on Aug 29 at his country home, Littlewick Place, near Maidenhead. He was the son of Charles James Miller of Manchester and was born at Eccles, Lancashire, in 1875 He married in 1908 Phyllis Tarbutt, and she survives him with two daughters

R. H. writes: "In Charles Miller we have lost a physician of the characteristically British type, for he was an excellent clinical observer, guided always by sound practical common sense, rather distrustful of the newer 'scientific' medicine and an admirable bedside teacher. His complete sincerity was apparent to all who came in contact with him, for he had a hatred of all that was false or pretentious and his bluff hearty manner endeared him to his friends, whilst the outspokenness with which he expressed his opinion made him respected by his opponents. He was, indeed, a 'white' man through and through His later years were clouded by ill health which he bore with stoicism, but the high compliment which was paid to him by his election as senior physician to University College Hospital was a source of great pleasure and encouragement. He died very suddenly, fortunate in that he did not live to see the actual outbreak of the present war to which, from his experience in the last, he had looked forward with horror. His home life was singularly happy, and deep sympathy will be felt for his widow and his two daughters"

LETTERS TO THE EDITOR

NEUROSIS OR PSYCHOSIS?

SIR,—Dr. Gillespie's comment on your leading article of Aug 19 is perhaps based upon misunderstanding of the view taken by at least some who hold that the difference between neurosis and psychosis is quantitative rather than qualitative. He supposes that this view implies that "since the neuroses are but mild psychoses, and since psychotherapy is of little use in the latter, so it is of minor importance in the former" These assumptions require scrutiny. It is true that certain aspects of the mental disorder encountered in the psychotic—such as relative inaccessibility and lack of insight—obstruct or prevent the use of psychotherapy. Nevertheless there are psychotic patients who undoubtedly do benefit from this form of treatment Apart from the question of scientific accuracy therefore, I believe one of the disadvantages of a qualitative distinction between neuroses and psychoses to be this, that it may encourage the physician, having labelled a patient psychotic, to assume that psychotherapy cannot help him.

Dr Gillespie's second assumption, that if the quantitative distinction be accepted and it be admitted that psychotherapy is of little value for the psychoses, therefore it is of minor importance for the neuroses, is surely unfounded. Because operation is of little use in certain advanced cases of malignant disease it does not follow that it is of minor importance in the treatment of more circumscribed growths of the same histological type

I am entirely in agreement with Dr. Gillespie in his objection to the recognition of lay psychotherapists In fact I believe that if a man is to become a good psychotherapist he must needs first be a good doctor

Finally, Dr. Gillespie quotes from my lecture words which, when detached from their context, appear to contain an overstatement. I accept of course Dr. Gillespie's view that there is room, and more room, for specialist psychotherapy, and that the man who has had a long training and devotes himself entirely to this work, can achieve results—especially in the more difficult cases—which are beyond the reach of the ordinary practitioner. But it is the ordinary practitioner who has to, or ought to, treat the great majority of neurotic patients, and for him some simpler and shorter training must suffice Moreover, I believe that the simpler forms of psychotherapy, as opposed to the more recondite, are very often successful

So much has now been written about the different methods of psychological treatment, especially the analytic kind, that the general practitioner is apt to be frightened of the subject altogether, apt to feel that, unless he has had a prolonged course of training, he cannot tackle his neurotic patients with any hope of success This view I believe to be wrong I

maintain that a good doctor, with the right personal qualities and with a few fundamental principles to guide him, can learn from his own experience to be a good "general" psychotherapist That is to say, he will be able to treat most of his neurotic patients successfully The exceptional cases he will refer to the specialist

If, then, adequate provision is to be made for the treatment of the neuroses, those who are responsible for medical education should have two objects in mind One is the training of specialists in the more recondite methods of psychotherapy, the other is the training of the medical student and general practitioner in the shorter and simpler methods

It was to an audience of medical students that my lecture was addressed

I am, Sir, yours faithfully,

Henley-on Thames, Sept 3 C P SYMONDS

PULMONARY TUBERCULOSIS AND ANTUITRIN S

SIR,—From the response of one case of pulmonary tuberculosis to treatment, it is useless to attempt to prove anything But for the war, I should have tried out what I now describe on a series of patients As it is, I leave the proof or disproof of my inferences to others I feel I must, however, record my findings, firstly because they were so dramatic, and secondly because they were, for theoretical reasons, expected Further, the antithesis of the treatment nearly killed a control patient

The theoretical observations which led me to try out my new line of treatment were as follows Pulmonary tuberculosis is a common disease in young women It is especially common in the flat breasted, thin, under developed, sexless type with scanty periods, this type does not do well Although amenorrhœa is produced by any disease which causes cachexia, anæmia and ill health in pulmonary tuberculosis, it is often present before these have appeared After sexual activity or child bearing, the type of female I mentioned often becomes more physically fit and sexually developed (assuming she has not yet had tuberculosis) I therefore suggest that in as much as immunity depends upon physical fitness, it depends also upon a sound set of endocrines With these thoughts in mind I tried out a pituitary preparation as a therapeutic measure to increase the resistance of one of these poorly developed tuberculous women

A female, 34 years of age had been suffering from schizophrenia for 13 years She made no mental improvement during this time but till two years ago her physical health remained satisfactory She then started to lose weight gradually but not consistently, gaining in some months and losing in others Three months ago the fall in weight became continuous at the rate of 1 to 3 lb per month I first saw her on July 9 this year She had abnormal physical signs at her right apex, her sputum contained tubercle bacilli, and the X ray showed advanced right sided unilateral pulmonary tuberculosis She had had amenorrhœa for some years but this was probably secondary to her mental disorder She had only a slight cough and had never had a hæmoptysis She was seen by a consulting physician who suggested that the disease had been present for two years in as much as her weight had fluctuated for that time

She was treated symptomatically and from July 9 till August 12 she ran an intermittent temperature rising every night to about 100° F The pulse varied between 110 and 120 On August 14 she was given 2 c cm of Antuitrin S, and the dose was repeated every other day for four doses in all It was then raised to 5 c cm still on alternate days for another four doses On the day after starting this treatment her pulse dropped to 90 and has never since risen above 110 On the eighth day her temperature was normal and has since never risen above normal

During July she lost 8 lb in weight In the last three weeks she has regained this to within 2 lb

The antithesis was when I tried giving Antuitrin G to a similar patient, there was a considerable rise of temperature and pulse

I know only too well that tuberculosis shows remissions and exacerbations, but in the case I have described I ventured to expect this remission, and it followed immediately upon starting treatment

I am, Sir, yours faithfully,

Orpington, Kent, Sept 3 D G PRICE

A PEACE OF UNDERSTANDING

SIR,—Your leading article under this heading must have been to many like a bright and helpful light, giving a lead for constructive effort when the need for it is great During the twenty-five years since 1914 medical psychologists and psychiatrists have fully confirmed in clinical practice the superiority of sympathetic understanding over coercion as a basis for the control of anti social violence in individuals whose mentality is unbalanced This knowledge is surely the best available basis for an effective long-term policy aiming at the elimination of similar destructive urges in the international field

But, as you pointed out last week, to deal with the disruptive force of this kind of aggression we need a moral courage to face the evils in our own human nature If we are to make of this war—or rather of the peace which we and our allies hope to be able to shape when it is over—something better than a repetition of the mistakes made from 1914 onwards, it is essential that enough of our people, and especially those in authority, should find this moral courage

The lead might well come from those of our profession whose experience enables them to agree at once with the views which you have expressed, since they at least can recognise the harm done by their own mistakes The difficulty is to put forward these views in such a way as to enable others to accept them It would be a fatal error to embark on propaganda which might appear to those to whom it is addressed as an accusation of moral turpitude, conscious or unconscious We all know that the inevitable result of such an approach is to strengthen the defences against conviction My hope is that the lead which you have given may bring together a few hundred medical men and women who will first discipline themselves so that they may eliminate all appearance of self righteousness and superiority from their relationship with the public They might even set themselves the task of achieving unanimity in their pronouncements and publish an account of their difficulties in this achievement, in sufficient detail to show that they have had to overcome the same weaknesses in themselves which they invite others to tackle

I venture to suggest that you should make available for distribution to the public copies of your leading article of last week, or an adaptation of it addressed especially to them, and, so that no individual need assert himself as the prime mover, you should take the initial steps in bringing together those who wish to act vigorously in the direction you have indicated

I am, Sir, yours faithfully,

Devonshire Place W 1 Sept 5 J NORMAN GLAISTER

LANDING AT DOVER

SIR,—In Grains and Scruples of your issue for Christmas week, 1937, I made an appeal for funds to allow some care to be taken at Dover marine station of the Austrian and German domestics then entering the country in large numbers and often in a state of collapse after their journey. The sum of £45 15*s* was collected and, as this fund is now to be wound up, those readers who generously subscribed to it may like to know how the money was spent and what it is proposed to do with the balance remaining. It may be mentioned that the two largest donations came from the German embassy and an anonymous donor.

The London branch of the Travellers Aid Society, who administered the fund, found a German-speaking resident of Dover who proved to be the ideal person for the task. For a small weekly sum, she met every day during the twelve months from January, 1938, the two boats on which most of the foreign domestics arrived. The nature of the work done can best be shown by some extracts from this lady's reports:—

February.—During this week I met approximately 250 foreign maids who passed through the port of Dover. These consisted of Austrians, Hungarians, Swiss and Germans. All could speak German but not one had a working knowledge of English I met them before they passed through the passport office and explained what they would have to do in regard to passport, medical and customs examinations and from which platform their train would go. I helped as much as I could with the translation at the medical office and customs.

. . . I have also been able to help with outgoing maids, as yesterday when an official asked for my help with an Austrian maid who had lost the only boat for Ostend She was very frightened and had very little money but I was able to find her a cheap lodging in the youth hostel here and then see her off by the boat next day.

March.—All of these girls are in real need of help . . they are almost overcome with fatigue and seasickness They are in most cases of a simple nature, coming as they do from little villages and farms, and they are quite at a loss to know what to do on arrival: I often am asked to fill in their landing cards.

Many of them have but the vaguest of ideas where their destinations are . . Girls weeping bitterly who have lost or mislaid their suitcases, others who are desperately anxious because they have missed their train and a regrettable few who are not allowed to land and stand bewildered and downcast wondering how they will return to their own country. . . it is touching to see their gratitude after some soothing explanations in their own language.

It is pleasant to record the helpfulness of the officials; the recognition of the work by the Southern Railway, shown by their reservation of two compartments for the girls; the kindness of the station caterers, Messrs Frederick Hotels Ltd, in allowing tea to be obtained at half-price; and the generosity of the large majority of porters who forwent their usual tips in needy cases Finally, a generous tribute has been paid in the annual report of the medical inspector of aliens at Dover—who first pointed out the need for the work—that it had "earned the gratitude of some 9000 weary, homesick, hungry servant girls who arrived at Dover during the year"

At the end of January, 1938, the Travellers Aid Society (London branch) became amalgamated with the National Vigilance Association and about the same time the society's worker found herself obliged to give up the work. Fortunately by this time a radical change had occurred, chiefly as a result of the discouragement by the German authorities of their nationals from taking up domestic service abroad Some Germans and Austrians continue to enter with permits for domestic service but they are nearly all refugees of a somewhat different social class. Swiss, Hungarians and other nationalities still enter but they seem to be better organised and cared for It is the general opinion that the work may now be *given up without much hardship and it is* proposed to hand over the balance of the money subscribed, £17 3*s*, to another fund with similar objects · the Germany emergency committee of the Society of Friends would seem to be an appropriate recipient.

I am, Sir, yours faithfully,

Aug 10 CIVIL SERVANT

*** It may still be of interest to put on record a piece of beneficent work now so completely closed—ED. L.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUG. 26, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1170; diphtheria, 745; enteric fever, 62 (57 "expected"), pneumonia (primary or influenzal), 328; puerperal pyrexia, 183; cerebro-spinal fever, 19; poliomyelitis, 34; polio-encephalitis, 2; encephalitis lethargica, 2; dysentery, 32; ophthalmia neonatorum, 85. No case of cholera, plague, or typhus fever was notified during the week

Deaths.—In 126 great towns, including London, there was no death from smallpox, 1 (0) from enteric fever, 2 (0) from measles, 1 (0) from scarlet fever, 14 (5) from whooping-cough, 16 (2) from diphtheria, 32 (5) from diarrhœa and enteritis under two years, and 15 (2) from influenza. The figures in parentheses are those for London itself.

Chesterfield reported the only death from typhoid Fatal cases of diphtheria were scattered over 12 great towns, Sunderland and Birmingham each reporting 2. Sunderland had 5 deaths from diphtheria, Birmingham 3

The number of stillbirths notified during the week was 240 (corresponding to a rate of 36 per 1000 total births), including 35 in London

The Lancet 100 Years Ago

September 7, 1839, p 867

From a report of the proceedings of the British Association.

We must notice an important practical suggestion of Professor GRAHAM at greater length, as it may be the means of saving many lives He observed that the *afterdamp*, or carbonic acid, left in the atmosphere of a mine, after explosion, is supposed to occasion in many instances a greater loss of life than the explosion, at the same time it renders assistance impracticable. In many cases the oxygen of the air is not exhausted by the explosion, although, from the presence of five or ten per cent of carbonic acid, it is rendered irrespirable The atmosphere will be rendered respirable by withdrawing carbonic acid, and he suggested a method by which this might be effected. He found that a *mixture of slaked lime and pounded Glauber's salts, in equal proportions*, has a singular avidity for carbonic acid, and that air might be purified completely from that deleterious gas, *by inhaling it through a cushion of not more than an inch in thickness, filled with that mixture*, which could be done without difficulty

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". . . Alfred Marshall avoids the term 'standard of living' and distinguishes between the *standard of life*, meaning 'the standard of activities adjusted to wants,' and the *standard of comfort*, 'a term that may suggest a mere increase of artificial wants, among which perhaps the grosser wants may predominate.' 'A rise in the standard of life implies an increase in intelligence and energy and self-respect; leading to more care and judgment in expenditure, and to an avoidance of food and drink that gratify the appetite but afford no strength, and of ways of living that are unwholesome physically and morally.'"—STUART A. RICE, *Science*, Aug. 25, 1939, p 167.

PARLIAMENTARY INTELLIGENCE

FROM THE PRESS GALLERY

Military Service from 18 to 40

IN the House of Commons on Sept 2, Mr ERNEST BROWN, Minister of Labour, asked leave to introduce a bill to render all fit male British subjects of the ages of 18 to 40 inclusive liable to be called up for service in the armed forces of the Crown during the war emergency He said the bill itself did not in general directly place a liability on these citizens to be called up for service, but it provided for a proclamation to be issued from time to time Men liable to be called up for service would be required to register, they would be medically examined and they would receive their enlistment notice The procedure for these purposes would be similar to that which had been applied in respect of militiamen under the Military Training Act

Sir DENNICK GUNSTON said that undergraduates at the universities under the Military Training Act were allowed, and indeed compelled, to postpone their service He wished to know whether this new measure would abolish such postponement of service

Mr HORE BELISHA, Secretary of State for War, said for all intents and purposes the Military Training Act fell to the ground, and was replaced by this bill The young men who had obtained postponement under the Military Training Act would fall within their age groups, and would be entitled to seek postponement in the way provided in the present bill

Leave was granted, and the bill was read a second time On Sept 3 the bill passed through all its remaining stages in both houses and was given the royal assent

Compensation for War Injuries

On Sept 2 in the House of Commons Sir WALTER WOMERSLEY, Minister of Pensions, asked leave to introduce a bill to make provision as respects certain personal injuries sustained during the period of the present emergency He explained that the object of the measure was to provide for grants in respect of personal injuries or death caused by air raids, or other operations of war, to the civil population The injury allowances were designed to be immediate emergency payments to tide a man over the first results of an injury Treatment would also be given immediately under Ministry of Health arrangements at local hospitals, or by private practitioners, if the case was not sufficiently serious to go to hospital After sufficient time had elapsed to judge the conditions, if it was found that the case involved serious and prolonged disablement, then the bill provided that a pension might be granted for a period or permanently, as might be required by the circumstances Pensions would be awarded on service lines, that was to say, in accordance with the medically certified degree of physical disablement The bill suspended the exercise of rights under the Workmen's Compensation Acts, or rights at Common Law, or under contract, in the case of incapacity for work caused by war injuries or war service injuries The grant of injury allowances and pensions would take the place of any compensation which a man might otherwise be able to obtain by an action at law

Dr HADEN GUEST asked whether the class of case in which primary injury might be trivial, but the final injury might be very serious, would be adequately looked after There were many cases, he said, where an injury to the head appeared at first to be nothing much more serious than a scalp wound followed in a little time by a headache, but finally there might be found an actual effusion of blood below the skull, causing pressure on the brain and giving rise to very serious nervous conditions or even sudden death Unless a preliminary injury was very carefully diagnosed and recorded those cases might be very difficult to deal with, because there would not be adequate evidence of how the injury occurred Another class of injuries which was likely to occur under war conditions were psychic injuries, apart from the purely physical nervous apparatus, as a result of which, after a considerable period, a person might suffer from a nervous condition directly attributable to the injury, although the injury might have been at the beginning a very small thing Omission to pay adequate compensation to an individual injured might be safeguarded against if provision was made that all war injuries, especially those likely to lead to nervous or psychic disturbances, were very carefully recorded at the time they took place

Sir WALTER WOMERSLEY said he had secured a committee of eminent medical specialists on nervous diseases, who would make to him a full report He would then be able to act on their report, as upon other matters that might be brought forward from time to time by expert medical advisers

Leave was granted, and the bill was read a second time On Sept 3 the bill passed through all its remaining stages in both houses, and was given the royal assent

War Service and Health Insurance

On Sept 2 in the House of Commons Mr ELLIOT, Minister of Health, asked leave to introduce a bill the main object of which, he said, was to secure that persons insured under the scheme of National Health Insurance contributory pensions did not suffer any loss of rights under those schemes by reason of joining the armed forces of the Crown, or entering upon war occupations The bill provided, in effect, that on return to civil life all such persons would find themselves in the same position as if they had been continuously in insurable employment throughout their period of service or war occupation There was a further provision in the bill dealing with the adjustment of health insurance benefits and contributory pensions to payments which were made in respect of war injuries or pensions paid in respect of death due to war In effect the bill merely secured that double payments from public funds were not made in respect of the same event, the approved societies, that was to say, were safeguarded against having to make payments for which no financial provision was made in the scheme of national health insurance There were further provisions to the effect that insured persons would be able to secure payment of benefits or pension although the records affecting their title might not be available when the claim arose, due to the possible destruction of records as a result of the war

Leave was granted, and the bill was read a second time On Sept. 3 the bill passed through all its remaining stages in both houses and received the royal assent

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Surgeon Commander J F M CAMPBELL, M B, has been appointed to the Admiralty and will serve as assistant to the Medical Director General in succession to Surgeon Commander A W North L M S S A, who, after four years there, has received another appointment

Dr W HARVEY SMITH died on Sept 1 at Merriden, Warwickshire, where he was equally well known as family doctor, county magistrate, sportsman and raconteur For 35 years he was medical officer to the local poor law institution Always a lover of animals he was as much at home with their injuries and diseases as with those of his human patients When he reluctantly gave up his dogcart it was for an open car in which he always drove in one gear He was in his 84th year

Dr P W MACLEAN, who died on Aug 30 at the age of 68, had practised in Bradford since 1912 when he retired from the Navy as staff surgeon His wife is Miss Phyllis Hambledon the novelist

MEDICAL NEWS

Society of Apothecaries of London

At recent examinations the following were successful:

Surgery.—J. V. Braithwaite, W. D. Jenkins, E. A. Milner, T. Owen, D. B. Roberts, E. Smith, H. F. Sparling, E. Wolfendale and H. Woolwich.

Medicine.—E. J. S. Barthorpe, A. N. Boyle, R. M. Coplans, M. E. Davies, D. H. Dracup, R. H. Gaman, T. L. B. Iredale, J. Lieber, M. C. Mair, E. C. G. Miller, E. A. Milner, D. Prysor-Jones and G. L. L. Reynolds.

Forensic Medicine.—E. J. S. Barthorpe, A. N. Boyle, R. M. Coplans, M. E. Davies, D. H. Dracup, R. H. Gaman, T. L. B. Iredale, J. Lieber, M. C. Mair, E. C. G. Miller, E. A. Milner, D. Prysor-Jones and G. L. L. Reynolds.

Midwifery.—C. Bucknall, D. W. Burnford, P. S. Clarke, G. O. C. Davies-Webb, W. Gordon, K. P. D. Griffiths, S. T. Nakib, K. W. N. Palmer, V. N. Stevenage and M. Venugopalacharli.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery and midwifery:

A. N. Boyle, Manc.; R. M. Coplans, Middlesex; D. H. Dracup, Lond. Hosp.; K. P. D. Griffiths, Charing Cross; T. L. B. Iredale, Leeds and West Lond.; J. Lieber, St. George's, E. C. G. Miller, Melb.; D. Prysor-Jones, L'pool; E. Smith, Oxfd. and Guy's; V. N. Stevenage, Madras and West Lond.; and H. Woolwich, L'pool.

University of Aberdeen

As reported by our Scottish correspondent on p. 617, Mr. W. C. Wilson, director of the unit for clinical research in surgery at the Edinburgh Royal Infirmary, has been appointed regius professor of surgery in the University.

Joint Tuberculosis Council

This council has arranged to hold a course in radiology at the clinic, Shire Hall, Castle Hill, Cambridge, from Sept. 20 to 22. A course in the diagnosis and treatment of pulmonary tuberculosis in Lancashire will be held at the Tuberculosis Offices, 352 Oxford Road, Manchester, from Oct. 10 to 14. Further information about these courses may be had from the hon. secretary of the council, Dr. J. B. McDougall, Preston Hall, near Maidstone, Kent.

Research Scholarship in Ophthalmology

A George Brewster and Jennie Mathews honorarium of $1000 is offered through the International Association for the Prevention of Blindness for original work in simple non-inflammatory glaucoma. Papers may be written in English, French, German or Italian; in order to facilitate the task of the jury, papers written in the last two languages should be accompanied by a translation in English or French. Further information may be had from the secretary of the association, 66 Boulevard Saint-Michel, Paris.

Hand-lamps for A.R.P.

The British Standards Institution has drawn up a specification for electric hand-lamps, fitted with a primary battery or unspillable accumulator, for general use during a black-out, either out-of-doors or in buildings in which the windows, roof lights and so on are not screened. The ordinary torch type of hand-lamp is not entirely suitable because no means are provided for preventing the light being directed upwards. The specification provides that the light emitted shall be properly directed and screened. Copies of the specification can be obtained from the institution at 28, Victoria Street, Westminster, S.W.1, price 3d.

The School-leaving Age

The Education Act, 1936, came into force on the 1st of this month. This raises the age for compulsory attendance at school from 14 to 15, and no child born after Sept. 1, 1925, will in future be allowed to leave school before the age of 15 unless he or she obtains an employment certificate from the local education authority.

Badge of Office

The Ministry of Health announces that full-time medical officers of the Emergency Medical Service will wear on their right arm a twill brassard bearing the letters "E.M.S." in deep red on a blue background.

International Congress for Life-saving and First-aid

The fifth international congress for life-saving and first-aid to the injured was held in Switzerland from July 23 to 28. Colonel Patry, vice-president of the international committee of the Red Cross, stressed the need for standardising first-aid equipment for use in major international catastrophes. Among the subjects discussed were first-aid work at sea and in town and in country, and in factories and in mines. Artificial respiration, the treatment of wounds and shock, and the training of the first-aid worker were also considered.

British Association

On Friday, Sept. 1, the remainder of the sessions of the association's meeting at Dundee were cancelled. Sir Richard Gregory, F.R.S., was elected president for the coming year.

Austrian Refugees

The Home Office has received from the Committee of Austrians in England a detailed list of the Austrians who have registered at the Austrian Centre, with an assurance that they will do all they can to help this country in wartime. The list includes 71 chemists, 108 female and 6 male nurses, and 41 doctors.

Local Medical and Panel Committee for London

The functions of this Committee, under the N.H.I. Acts and regulations, are now vested in a controller and an emergency committee of three. The chairman of the old committee automatically becomes the controller, while the committee of three are the former vice-chairman, the former treasurer and the former chairman of the finance and general purposes committee.

EMERGENCY NOTICES

The house and library of the Royal Society of Medicine will be closed for 14 days from the date of the outbreak of war. At the end of that time they will, if possible, reopen.

The staff and records of the Joint Council of the Order of St. John and the British Red Cross Society have been removed to Eastbourne, but the full staff of the ambulance department will remain at the headquarters, 12, Grosvenor Crescent, London, S.W.1.

The offices of the Chartered Society of Massage and Medical Gymnastics have been moved to Mount Lodge, Chesham Road, Amersham, Bucks. The society's annual congress, which was to have been held in London from September 18 to 22, has been cancelled.

The Clinical Research Association has moved to Hilton's Annexe, South Road, Haywards Heath, Sussex. Tel. Haywards Heath 576. Labels with the new address will be forwarded on application.

The *Chemist and Druggist* will for the present be printed at Bath, and all correspondence to the editor should be sent to him there *c/o* The Pitman Press. The inquiry department will remain open at the London office, 26, Essex Street, W.C.2.

Until further notice the address of the Incorporated Society of Chiropodists will be Red Porch, Ashley Close, Walton-on-Thames, Surrey.

The offices of the Medical Research Council, which are at present largely occupied with emergency work, have been temporarily removed to the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1 (Museum 3041).

The offices of the Medical Women's Federation have been moved to 73, Bourne Way, Hayes, Bromley, Kent (Tel. Hurstway 1901).

Medical Diary

UNIVERSITY OF GLASGOW
TUESDAY Sept 12—1 30 P M (Tennent Memorial Building 38 Church Street), Dr John Marshall Problems of Blindness—Causes and Prevention

Appointments

DUNSCOMBE, W K M D Durh D P H D T M & H, medical officer of health for Shaftesbury Sturminster, and Sherborne
MATTHEWS J N, M R C S, D P H, senior medical officer and assistant to the medical officer of health for Brighton
THURMAN, R S, M B Lond F R C S E, resident surgical officer at St. James s Hospital, Leeds
WALKER A. J, M B Lond, resident medical officer at the Royal Bath Hospital, Harrogate

London County Council—The following appointments and promotions are announced A M O (I) or (II) = assistant medical officer (class I) or (class II) —
CLARKE, W E M B Lond A M O (I) St Pancras
FORSTER, DOROTHY D M B Lond deputy medical superintendent (class IV), Heatherwood
GRIDDLE, J M, M B Aberd A M O (II), Hackney
GRIFN, R D M D Lond, M R C P, Senior A M O (II), St Peter's,
HINDEN ELLISON, M B Camb, M R C P, A M O (I), St Leonard's
MCGUINNESS A E, M B Sydney A M O (I), Fulham
MACKINTOSH, F G, M B Aberd, A M O (II), Queen Mary s, Sidcup
NORMAN JONES DOROTHEA M, M B Camb, D P H A M D (II), Hackney
STURGEON A W, M D Toronto A M O (II) St Francis
Examining Surgeons under the Factories Act, 1937 Dr S CAMPBELL (St Just district Cornwall) Dr I F W EDWARDS (Kenninghall District Norfolk)
Medical Referee under the Workmen s Compensation Act, 1925 Dr P H O DONOVAN for the County Court districts of Newark and Nottingham (Circuit No 18)

Vacancies

Albert Dock Hosp, Alnwick Road E 16—Second Res M O, at rate of £110
Birkenhead County Borough.—A M O, £600
Bolton Co Borough Townleys Hosp—Third asst M O £3.0 Also 4th asst M O, £250
Bolingbroke Hospital Wandsworth Common, S W 11—R S O, £300 Also H P and Cas O each at rate of £120
Brighton Royal Sussex County Hospital—Third Hon Radiologist
Cambridge Addenbrooke s Hosp—Res anæsthetist and emergency officer at rate of £130
Dorset County—Assistant County M O, £500
Dreadnought Hosp, Greenwich S E 10—H P and H S each at rate of £120
Dunedin Hospital, New Zealand—Radiotherapist £1100
East End Maternity Hosp 306 *Commercial Road E* 1—R M O at rate of £150
Government of India Army Medical Service.—Commissions
Guildford Royal Surrey County Hospital—H S £150
London Hospital, E 1—First Asst and Registrar to E N & T Dept, £150 Also Surgical First Asst and Registrar, £100
Lydia Borough Pathologist and Bacteriologist, £650
Manchester Withington Hosp—Asst to Hon Obstet Officer, at rate of £250 Also Res Asst M O at rate of £200
Metropolitan Hospital Kingsland Road E 8—Resident Appointments at rate of £100
Plymouth Prince of Wales s Hosp Greenbank Road—H S at rate of £120
Plymouth Prince of Wales s Hosp—Sen and Jun H.S 's for Devonport section at rate of £130 and £120 respectively
Princess Louise Kensington Hosp for Women, St Quintin Ave, Kensington, W 10—H P and H S, each at rate of £120
Preston County Borough, Sharoe Green Hosp—Jun Asst R M O at rate of £100
Rochford (Essex) Guildcharch County Hospital—Asst Res Surgeon £350
Royal College of Surgeons of England—Examiner
Salvation Army Bethesda Hosp, Lower Clapton Road, E 5.—Jun Res M O at rate of £40
South London Hosp for Women and Children—H P, at rate of £150
St. Marylebone Borough Council—Public vaccinators £90 and £30 approx (according to district)
Staffordshire County Council—Asst county M O £400
Tottenham, Borough—Temporary asst M O H (A R P) £5.0
Union of South Africa Dept of Public Health—Dietitian £.50
Warrington Infirmary and Dispensary—Third resident at rate of £150
Wickford (Essex) Essex Rumwell Hosp—H P at rate of £150
Willesden General Hosp—Asst M O at rate of £100
The Chief Inspector of Factories announces a vacant appointment for Examining Surgeon at Thame, Oxon

Births, Marriages and Deaths

BIRTHS

BELL SMITH—On Aug 27, at Waltham Abbey, Essex, the wife of Dr Donald Bell-Smith—a daughter
DAVISON—On Aug 31, the wife of Dr George Davison, of Cramlington—a daughter
GRIFFIN—On Sept 2, at Uppingham, the wife of Dr E M Griffin—a son
JOYCE—On Aug 31 at Hong Kong, the wife of Surgeon Commander A de B Joyce, R.N.—a daughter
ROBSON—On Sept 5, at Llandudno, the wife of Dr J R. Robson—a son
SCOTT—On Aug 29, at Newcastle on Tyne, the wife of Capt. R W Scott R.A.M.C.—a daughter
TULLOH—On Aug 29, at Bournemouth, the wife of Dr E P Tulloh—a daughter
WALLFT—On Aug 27, at Chard, the wife of Dr J F Loader Walley—a daughter

MARRIAGES

ANDERSON—SHARP.—On Aug 27, at Hendon, Anthony Francis Anderson, M B, to Helen Margaret Sharp
CHILD—BOYD—On Sept 3 at Brighton John Peto Child, B M, to Margot Janet Laurie, only child of Sir Hubert Bond, K B E, F R C P
CRIMMIN—POOK.—On Aug 26, at Soho Square Capt George William Crimmin R.A.M.C. to Megan Pook
CROSS—CORBY.—On Sept 2 at Liss, Alexander Galbraith Cross, F R C S to Eileen Longman
DANIELL—BENSUSAN BUTT—On Aug 30 at Colchester, Peter Wilberforce Daniell, to Mary Barbara Bensusan Butt, M B, daughter of Dr Ruth Bensusan Butt of Colchester
MCILWRAITH—LEWIS.—On Aug 26 at Holy Cross, Edinburgh Patrick William Fitzjames McIlwraith L.R.C.P.E, of Edinburgh to Margaret Lewis of Hove Sussex
PHILIP—FLEW.—On Sept 4 at Ealing, William Marshall Philip M B, to Yolande Flew
PORTER—WYATT.—On Sept 1 at Woodbridge, Hugh Lachlan Porter M B, to Barbara Mary Wyatt
SHORT.—PEARCE.—On Aug 26 at Holy Trinity Church Kingsway, Thomas Leonard Hall Shore, M B, to Madeleine Elsie Pearce
SUTCLIFFE—SHELDRAKE.—On Sept. 2, at the Brompton Oratory, Lieutenant William Greenwood Sutcliffe, R A M C, son of Lieut-Colonel D G Sutcliffe, O B E, F R C S, of Margate to Mary Charlotte Sheldrake, of Kelvedon Essex
SHUTTLWORTH RENDALL—HORNSBY.—On Sept 3, at Barnet David Charles Shuttleworth Rendall, M R C S, to Dorothy Hornsby
TELLING—GORDON.—On Sept 2 at Marylebone, Otto Maxwell Telling B M, to Dorothy Gordon
WOOD—JOHNSTON.—On Aug 26 at Enfield, William Wallace Wood M B, to Theodora Johnston M R.C.S

DEATHS

BLACKSTONE.—On Sept 3 at West Worthing, Sussex, Willoughby Arthur Blackstone, M R C S
MARLING.—On Sept. 3 Dorothy Barbara Marling M B Lond
MITCHELL.—On Sept 1, at Old Hill, Staffs, Thomas Ellis Mitchell M B Camb
MILLER.—On Tuesday Aug 29 at Littlewick Place near Maidenhead Charles Hewitt Miller C B E, M D Camb, F R C P, of Portland Place W, aged 64
MILLER.—On Aug 31, Richard Miller, M R.C.S, D T M & H, of Hove
ORR—On Aug 28, at Bangor Ulster William Young Orr, M B Edin D P H late of Putney, S W
RUSSELL RYAN—On Aug 28, John Russell Ryan M D Dubl, aged 77
ROBERTS—On Sept 2 Charles Michael Roberts, M B Lond of Woking, aged 59
THOMSON—On Aug 30 at Firetat France, Major Douglas Thomson M B Dubl D P H R.A.M.C (retd) late Sudan Political Service

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CIBA LIMITED state that they have ample supplies of Percaine in its various forms ready for use and, in addition stocks of raw material from which percaine will shortly be manufactured in their new laboratories at Horsham

"It might be imagined that signs of hyperneurousness when facing medical examiners augur ill for an ability to withstand nervous strain This is very far from being the case and many examples can be given of excellent pilots who have been of a hyperneurous type In one instance a pilot, whose war record could only be described as first class, inevitably fainted when sitting in the dentist's chair Many of the pilots who won Victoria Crosses in the war were of a quiet sensitive type, and some were distinctly hyperneurous If a candidate despite a fast pulse a high pulse pressure, and other signs of nervousness can yet show a quiet demeanour and an ability to think quickly, and answer readily, when he faces his medical examiner, it speaks well for his chances of making good"—Group-Captain A P Rook, *J R nav med Serv* July, 1939, p 204

NOTES, COMMENTS AND ABSTRACTS

IMMUNISATION AGAINST SCARLET FEVER IN FINLAND

THE Finnish army is unusually prone to streptococcal infections, manifest as sore-throat and scarlet fever. T. W. Wartiovaara is inclined to attribute this susceptibility to climatic conditions and to the sparse distribution of the community, which prevents young men from meeting streptococci till they are herded together in barracks (*Nord. Med.* June 3, 1939, p. 1671). Be this as it may, there have lately been 500–1000 cases of scarlet fever and 8–17 scarlatinal deaths every year in the army. Dick-testing on a large scale has shown only some 12–14 5 per cent. to be Dick-positive, but the scarlatinal morbidity among Dick-positive soldiers was 20 4 per cent. in 1933 and 14 4 per cent. in 1936, compared with 0 34 and 1 2 among the Dick-negative. Immunisation of the Dick-positive with toxin from an *American strain, Dochez NY5*, has yielded results encouraging as far as comparative freedom from scarlet fever is concerned, but rather discouraging as regards the reactions provoked Sudden malaise, vomiting, giddiness and attacks of shivering have been noted, and although these may be ascribed in some cases to the toxin having been injected into the muscles by misadventure, Wartiovaara records the impression that there is room for improvement in the preparation and dosage of the antigen before inoculation is generally applied.

WHEN THE BOMB FALLS

THE *doctor "on the spot"* brings with him a fund of technical knowledge, a head perhaps cooler than most, and the tools of his trade. Without the last, the others are of little value. The doctor's immediate duty is to restrain the enthusiasm of the first-aid worker. His second is to relieve pain. To do this, he must have a hypodermic syringe, a solution of morphia and a bottle of chloroform. Today doctors should cling as tightly to these as to their gas-masks. Morphia and a syringe can find a place in the pocket, and even chloroform may be carried in a hip flask In the big accident on the District railway at Charing Cross last September, H. J. B. Atkins,[1] who happened to be present, came away with the conclusion that morphia and chloroform were indispensable to the doctor on such occasions Chloroform is rapid in its effects and relatively non-inflammable, and so is to be preferred to any other anæsthetic.

CATERING IN WAR-TIME

THE recipes and menus prepared by the staff of the Gloucestershire Training College of Domestic Science for the use of teachers learning to take classes in war-time dietaries have been collected into a little book (Communal Dietaries in War-time. University of London Press. 1939 Pp 18. 1*s*.). The prescriptions have been tried out on and subjectively approved by the consumers in the college hall of residence, though young nettles, tender dock leaves, bracken and hop shoots, dandelion and sorrel may not be everyone's meat. Useful tables are included which help those who are faced with the problem of calculating tins of peaches, condensed milk and sardines in terms of protein and calories Many of the recipes are unusual and interesting, including one for "faggots," and many sound unexpectedly appetising. They are intended for groups of people larger than the ordinary family, but will appeal to all who wish to base their housekeeping on sound modern dietetic principles.

LIGHTER SIDE OF THE CIVIL SERVICE

WITHOUT the usual background of public-school and university education Mr. R. W. Harris, obviously an inspired examinee, entered the Civil Service as a boy-clerk in 1890. He was first promoted to the India Office and later to "Taxes" where he served with such distinction that he was transferred to Somerset House as assistant to Lord Chalmers This, however, did not mark the summit of his career, for in 1911 he was associated in the pioneer work of national health insurance administration with the great, but little known, W. J. Braithwaite. On retirement Harris became administrative secretary to the London School of Hygiene and Tropical Medicine, and at first sight these later activities might seem to be the only ones likely to interest medical readers In fact this is far from being the case. His book (Not so Humdrum. London: John Lane 1939 Pp. 271. 8*s*. 6*d*) teems with good stories adroitly told, and the author has found fun where others, less observant, might have missed it. At least one reader, having chuckled his way through it, closed the book with regret and a heightened respect for the Civil Service.

A NEW USE FOR OLD X-RAY FILMS

Mr. CLAUDE WHITE, M P.S, writes:—Many of us are wondering how to protect windows from the blast of high-explosive bombs. The following scheme has many advantages. The cost is very small; it takes little time to carry out and, when completed, does not disfigure the windows; and it makes a tidy and attractive piece of work which can be undertaken at odd moments and then forgotten. The basic element in the scheme is the discarded X-ray film. This is stripped of the emulsion and the clean piece of celluloid is attached to the glass window by means of celluloid varnish. The celluloid sheet is thick and robust and will not buckle and kink like the thinner variety one often sees recommended for this purpose Furthermore, it is non-inflammable. Some films have a blue base and these can be reserved for those windows where a slight light loss is of no importance

The best way to clean the plates is to soak them in very hot water, after which the emulsion can easily be rubbed off. *Pin them up to dry and store* till needed under a weight to keep them flat A suitable cement is made up of 5 parts of celluloid dissolved in 15 parts of acetone, to which is added 20 parts of copal varnish. Most hospitals will be glad to part with their discarded X-ray film for the asking. I am aware of quite a number of dispensaries where this method of window protection has been very successfully carried out.

SUBTROPICAL GARDENS

Dr. Jex-Blake has brought out a new edition, not this time of Gray's Anatomy but of "Gardening in *East Africa*,"[1] in which his exactitude and sense of proportion have served him well. It is indeed a practical handbook, for in its 26 chapters it deals in succession with climate, soil, growth factors, manuring, garden planning, horticulture, propagation, and the various kinds of plants to be cultured or propagated, and ends with chapters on garden pests, large and small. Curiously enough, only one chapter is devoted to the home flora, although its value is enhanced by the 10 coloured *plates of indigenous trees, shrubs* and plants which are a feature of this edition It seems that the European in East Africa likes to be reminded of the plants with which he was once familiar, in the same way as the exile in the Swiss Alps tries to grow hollyhocks and strawberries in a landscape of gentians and alpenrose. As an offset to the vast amount of ordered information in the book is a riotous essay on "gardens at the coast" in which Mr. H. B. Sharpe makes the very *shingle to blossom* So wide is its scope that the book may be of value to gardeners in almost any part of the globe.

1 A practical handbook by members of the Kenya horticultural society and of the Kenya, Uganda and Tanganyika civil services (2nd ed.) Edited by A J Jex Blake, D M Ogg, F R C P., with a foreword by Sir Arthur Hill F R S London: Longmans, Green and Co 1939 Pp 3[illegible] 12*s*. 6*d*

ADDRESSES AND ORIGINAL ARTICLES

POSTOPERATIVE THROMBOSIS AND EMBOLISM

MORTALITY AND MORBIDITY

By Robin Pilcher, M S Lond , F R C S

PROFESSOR OF SURGERY IN THE UNIVERSITY OF LONDON, DIRECTOR OF THE SURGICAL UNIT UNIVERSITY COLLEGE HOSPITAL LONDON

Since 1929 a careful search has been made in this hospital by surgeons and registrars for cases of post operative thrombosis and embolism It is not claimed that no cases have been missed, but records have been kept with care since the decision was taken to make special note of these conditions The diagnosis and recording has been made by many individuals, and the records vary in detail The interest of all members of the staff has been a safeguard in diagnosis, doubtful cases often being submitted to consultation For this reason, the diagnosis if recorded by a member of the staff has been accepted for purposes of this paper even when the evidence for it has not been recorded in detail

The records for the decade 1929–38 have been analysed to show the inter relation of thrombosis and embolism, and the mortality of the latter , the results are published in the hope that they may serve as a basis for comparison with series in which newer methods of treatment such as papaverin or heparin are used Good accounts of these and other remedies are being published, but there is little information available as to the natural morbidity or mortality In the series here presented prophylaxis of one sort or another has been tried, but no specific treatment of the established condition except embolectomy in one case

CRITERIA OF DIAGNOSIS

Since it is not practicable to give case records it is necessary to state the criterion of diagnosis and the extent to which they are fulfilled In both thrombosis and embolism there is a rise of temperature , in a previously afebrile case this is usually noticed, and is, in fact, very often the first indication of anything amiss In a febrile case a slight rise may be unnoticed, and when it occurs cannot be attributed necessarily to any complication It is unusual to find no fever In an afebrile case the onset of fever is probably the best indication of the time of onset of thrombosis It is always a little difficult to date this accurately, and it is usual to find that the rise of temperature precedes symptoms, but sometimes it follows them In simple thrombosis the rise is seldom of more than 1 5° F , but when embolism occurs the temperature rises higher and 101° is not uncommon A single attack of embolism gives a characteristic rise in the temperature chart lasting about 5 days The rise of temperature in a case of embolism often precedes the symptoms, and may be presumed to be due to undetected thrombosis

Thrombosis has only been diagnosed in the veins of the leg I have several times suspected hypogastric thrombosis on the symptoms described by Ducuing (1929), but have not made the diagnosis with certainty For example, there have been two fatal cases in which unexplained retention of urine occurred a few days before death The signs on which thrombosis is diagnosed are delayed cooling on exposure, pain and tenderness, œdema, slight cyanosis and fullness of superficial veins Of these, the most constant are tenderness and delayed cooling , these in conjunction with a rise of temperature would be regarded as evidence of thrombosis Sometimes the diagnosis is made first on the cooling test A patient has an unexpected rise of temperature and the legs are exposed for ten minutes, even if they look normal A marked difference of temperature is suggestive of thrombosis, the thrombosed leg being warmer, and I do not remember any case showing this sign alone which did not subsequently develop others This test is vitiated by operations or inflammatory lesions on the limb in question The degree of swelling is very variable and depends on other factors than thrombosis The impression is widespread that cases with much œdema, the true phlegmasia alba dolens, are less subject to embolism than those with little The signs of thrombosis enumerated above were not all present in every case As an example, out of 141 cases of thrombosis there were 20 in which there was no rise of temperature at the time of diagnosis of thrombosis, although in some it occurred before or after Of these 20 apparently afebrile cases of thrombosis, 9 had pulmonary embolism, some before the detection of the thrombosis In the diagnosis of embolism little importance is attached to the presence of recognised thrombosis and, in fact, in the majority of cases no thrombosis was found Unless, therefore, gross errors are made in the diagnosis of embolism, it must be accepted that many cases of thrombosis are not diagnosed The fact that thrombosis may be latent makes it difficult to assess its risks on the evidence of diagnosed cases

Pulmonary embolism in addition to fever has three important features pain, hæmoptysis, and signs of pleurisy or consolidation The pain is usually pleural, and although sudden in onset does not herald the lodgment of the embolus A large embolus produces a terrible sensation at its presumed time of impaction, but patients able to give an account of this after recovery do not describe it as pain but as a feeling of constriction of the chest associated with terror and a sense of impending death I have several times observed hæmoptysis before pain, and this is not surprising if the pain is caused by a pleural reaction Nor need it occasion surprise that pain is sometimes absent, since it would not be expected unless the pleural reaction were peripheral and it may be interlobar

It is unfortunate that the case records are often incomplete in certain particulars, but definite notes of the four features—fever, pain, hæmoptysis and signs of consolidation or pleurisy—are recorded in 68 cases out of a total of 111 non fatal embolisms Fever was present in all but 2 , in most it was clearly associated with the embolism , in a few there was already fever and an additional rise coincided with the embolism Pain was absent in 2 cases, hæmoptysis in 16 Physical signs of consolidation pleurisy or both were found in all but 3 cases All four signs were present in 48 of the 68 cases with full notes It may appear from these figures that diagnosis has been casual but as already stated it has only been accepted when vouched for by competent observers who have during the period taken a special interest in the disease

ANALYSIS

The results of the analysis are given in tables I II, and III

TABLE I—POSTOPERATIVE THROMBOSIS AND PULMONARY EMBOLISM IN SURGICAL WARDS OF UNIVERSITY COLLEGE HOSPITAL (1929–38)

	Cases
Femoral or crural thrombosis only	98
Thrombosis with non-fatal embolism	43
Non-fatal embolism without recognised thrombosis	68
Fatal embolism	44
Thrombosis or embolism diagnosed in life followed by death from other causes	8
Total	261

TABLE II—ASSOCIATION OF THROMBOSIS AND EMBOLISM

	Cases
1. *Thrombosis diagnosed in life*—	151
With non-fatal embolism (sometimes before recognised thrombosis)	43
With fatal embolism, first attack	3
With fatal embolism, later attacks	4
With death from other causes	3
2 *Embolism diagnosed in life*—	123
With recognised thrombosis	48
Subsequent fatal attacks	10
Subsequent death from other causes	2
Fatal first attacks	34
Total embolism fatal and non-fatal	157
3 *Fatal Embolism*—	44
Thrombosis or previous attacks of embolism	13
Unexpected deaths	31

TABLE III—MORTALITY-RATES

	Per cent
Mortality from embolism after diagnosis of thrombosis	4·6
Mortality from embolism in first attack	21·6
Mortality from embolism in survivors of first attack	8·1
Total mortality-rate of embolism	28·0
Mortality from embolism in all cases of thrombosis and embolism	16·8

As has been mentioned above, the majority of embolisms had no recognised thrombosis It will be seen that the mortality when embolism has been diagnosed is a little higher than when thrombosis only has been diagnosed, but the difference is not statistically significant, being less than twice the standard error of the difference In a previous paper (1937) dealing with fatal cases of embolism only I wrote that thrombosis of the veins of the leg or pelvis was found post mortem more often on the right than the left. In this, which is by contrast a clinical study, the reverse is found The figures are given in table IV.

TABLE IV—DISTRIBUTION BY SIDES OF THROMBOSIS (A) IN NON-FATAL CASES, (B) IN FATAL CASES

	A		B	
—	Thrombosis	Embolism	Thrombosis	Embolism and percentage of embolism
Right	42	15	43	16 (37)
Left	75	20	81	25 (31)
Both	20	7	23	8
Not noted	4	1	—	—

In the cases of thrombosis diagnosed in life there is a marked preponderance of left-sided cases, although right-sided cases show a higher incidence of embolism than left This difference is not significant, but taken with the findings in the post-mortem study referred to, suggests that a right-sided thrombosis is more likely to be complicated by embolism than a left

SUMMARY

(1) During the ten years 261 cases of thrombosis and embolism occurred in the surgical wards of the hospital

(2) The mortality-rate of the whole series was 16·8 per cent. The mortality-rate of the first attack of embolism was 21·6 per cent The total mortality-rate of embolism was 28 per cent

(3) Fatal embolism followed 4·6 per cent of diagnosed thromboses and 8·1 per cent. of diagnosed non-fatal embolisms. This difference is not statistically significant.

(4) In the majority of non-fatal embolisms no evidence of thrombosis was found. The majority of fatal embolisms were unexpected

(5) Thrombosis diagnosed in life is commoner on the left side than the right This is the reverse of the findings in a large post-mortem series of fatal embolisms

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THE ERYTHROCYTES-PLASMA INTERFACE

AND THE CONSEQUENCES OF ITS DIMINUTION

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BLOOD kept in vitro at body temperature for some hours changes distinctly in certain respects It can be either defibrinated or citrated blood but preferably blood with strong rouleaux formation and a high sedimentation-rate, such as horse's or human blood or blood from any of those countless pathological conditions in which it has a decreased suspension stability When such a warmed sample of blood has reached room temperature and the red corpuscles have been suspended again in the blood fluid by shaking, it becomes clear that their sedimentation-rate has been much diminished By the exclusion of other factors or by microscopical examination it is easy to infer that the reduced sedimentation-rate of the erythrocytes depends on a reduction of their rouleaux formation. Another observation, too, can be made by microscopical comparison—namely, that the thin biconcave disks of the normal erythrocytes have grown thicker and their diameter has diminished

The changes described (Fåhræus 1921) are as a rule well developed after warming for a few hours, and after twelve hours even the strongest rouleaux formation is usually destroyed The sedimentation-rate of the red corpuscles is, as a result, very low perhaps only a few millimetres an hour, and they have become completely spherical Let us say that the blood, when kept at body temperature, spontaneously increases its suspension stability.

In one respect it is easy to analyse the way in which this change comes about It consists partly of a primary change of the corpuscles and partly of a primary change of the plasma, which in its turn has a secondary effect on the corpuscles If red corpuscles, even when washed, are warmed separately and thereafter suspended in plasma, their rouleaux formation and sedimentation-rate are very much less than they were before warming, and the corpuscles become more spherical If blood fluid (serum or citrated plasma) alone is warmed it changes in such a way that red corpuscles suspended in it show reduced rouleaux formation and sedimentation-rate and tend to spherocytosis—in other words, exactly the same morphological changes which the red corpuscles

undergo when they are warmed separately The temperature range within which these changes of the blood fluid take place is 82°–118° F (at least with horse's blood), and they are most evident at about 108 5° F

By comparing the rise in suspension stability of whole blood with the effect produced in an artificial sample of blood in which only one chief component has been warmed, it is easy to convince oneself that the changes in the blood represent the sum of the changes in the corpuscles and in the plasma The primary change of the erythrocytes seems to be less important in increasing the stability than the secondary, which originates in changes in the plasma This applies in a high degree when warming takes place at normal body temperature and in a less degree at high fever temperatures These experiments have in more recent years been continued by Bergenhem and Fåhræus (1936) and by Bergenhem (1939) During this time we have concentrated on the process in the blood fluid, from now on called the stabilisation process The same term can be used for the process which takes place in the red corpuscles but is as yet uninvestigated

Stabilisation Process in Blood Fluid

If red corpuscles are suspended in blood fluid which has been kept at body temperature for some hours, they become, as stated above, more or less spherical and show reduced rouleaux formation and sedimentation rate If this artificial blood is now centrifuged and new corpuscles are added to the clear blood fluid, the new corpuscles behave in the same way as they would in natural blood fluid—i e, they maintain their shape, pronounced rouleaux formation, and high sedimentation rate This simple experiment shows that the spherocytosis and the reduced aggregation of the red corpuscles are caused by their adsorbing a substance which is formed during the warming of the blood fluid and may be called the stabilising substance

Many circumstances point to the fact that the stabilisation process in the blood fluid is enzymatic It has already been pointed out that it has a pronounced temperature optimum at 108 5° F If blood fluid is heated—e g, for ten minutes at 125° F—it is inactivated—i e, the formation of the stabilising substance is completely prevented, however long the blood fluid may be kept at body temperature afterwards Further observations pointing in the same direction are that an enzyme poison, such as quinine chloride, prevents the stabilisation process, and that hydrogen ion concentration has a great influence, the process being retarded in acid solution and strongest in a weak alkaline solution

FORMATION OF LYSOLECITHIN

Bergenhem and Fåhræus (1936) have shown that the stabilising substance is probably identical with lysolecithin produced from serum lecithin by a lecithinase In any case the alcoholic extract of the stabilised blood fluid contains in much greater quantities than does the natural blood fluid a substance which contains phosphorus, which is precipitated by ether, and which when dissolved in water has a haemolysing effect Lysolecithin has hitherto been known as the haemolysing substance which appears when the lecithinase of cobra venom is allowed to act on a substratum containing lecithin This suggestion that the stabilising substance is lysolecithin is supported by the fact that the stabilisation process in serum, inactivated by heating can be activated, and in native blood fluid intensified, by the addition of very small quantities of cobra venom The stabilisation process therefore can be said to give blood fluid pre haemolytic properties The changes which the erythrocytes undergo in stabilised plasma—i.e, spherocytosis and reduced aggregation—can be regarded as a preliminary stage to haemolysis The same can certainly be said also of the spherocytosis and reduced aggregation which take place when red corpuscles alone are kept at body temperature

SEPARATION OF ERYTHROCYTES AND PLASMA

Why is the blood in vivo not changed in the same way as in vitro? Why do the red corpuscles in the vascular system keep their rouleaux formation and biconcave shape, characteristics which they lose after some hours at body temperature in vitro? Or, to put the question in another way, what is the factor which produces the stabilisation process in the in-vitro experiments?

By chance I observed that blood more or less completely kept its rouleaux formation and sedimentation-rate, and the shape of the red corpuscles unchanged when during warming it was kept flowing in the receptacle either by gentle shaking or by slow rotation Misled by the fact that shaking of the blood fluid alone could also in certain cases hinder the stabilisation process—for reasons which were later investigated by Bergenhem (1939)—I believed at first that the inhibition by shaking was due solely to the movement of the blood In other words, the fact that the blood was stationary, which Bergenhem and I (1936) termed the blood's "endopause," was considered to cause in some unknown way the physico chemical conditions necessary for the stabilisation process

Later, influenced by Knisely's (1936) studies of the spleen, we discovered that another explanation was the right one The stabilisation process in stationary blood, both as regards blood fluid and corpuscles, is caused by the separation of these components by sedimentation of the red corpuscles Shaking has an inhibiting influence, therefore, because it continually mixes the red corpuscles and the blood fluid This is the only explanation for the slowing of the stabilisation process in a sample of blood which is stationary except for being shaken up some seconds every half hour But Bergenhem (1939) has proved that other conditions which bring the red corpuscles and the blood fluid together and thus make interaction between them possible also prevent the stabilisation process If, for example, during the warming of stationary blood care is taken to obtain a large contact surface between the red corpuscles and the plasma by keeping a small quantity of blood in a big flat receptacle, the raising of the blood's suspension stability can be hindered nearly as effectively as by shaking

These experiments seem to show that the red corpuscles prevent the blood fluid from receiving stabilising properties, and that the blood fluid prevents the corpuscles from being stabilised, or, in other words, blood fluid obstructs or neutralises the effect of the stabilisation process in the red corpuscles and red corpuscles obstruct or neutralise the effect of the stabilisation process in the blood fluid The nature of these reciprocally obstructing mechanisms is not yet known, but it can certainly be assumed that they take place upon the boundary surface between the corpuscles and the blood fluid—in other words, upon the erythrocytes plasma interface

The following provisional theory for the explanation of the red corpuscles power to hinder the stabilisation process in blood fluid has been given by

Bergenhem (1939) From experiments made by Bloor (1916), Knudson (1917) and Bodansky (1931) it can be assumed that the red corpuscles play an important part in the synthesis of phosphatides and therefore in the lipoid metabolism of the blood. Because of this it is possible that the derivatives of lecithin formed by the stabilisation process in the blood fluid—i.e., lysolecithin and an unsaturated fatty acid—are adsorbed on the surface of the red corpuscles and are there resynthesised into lecithin, this then returning to the blood fluid, and so on in a continuous cycle

No explanation, however, has been suggested of the other mechanism, which enables the blood fluid to prevent the stabilisation of the red corpuscles. Speculation cannot come into the question here before this mechanism is partly explained The only relevant observation that I have found is that the warming of red corpuscles increases the amount of free fatty acids (Weigert 1900)

The uncertainty in these matters, however, does not extend to the question, asked above, how it comes about that blood with a low suspension stability can maintain it in the vascular system for long periods The reason why a pneumonia patient for weeks, a pregnant woman for months, and a horse throughout its life have biconcave corpuscles with conspicuous rouleaux formation and high sedimentation-rate must be that the stabilisation process, as regards both corpuscles and blood fluid, is prevented or has its effect neutralised by the circulation of the blood, which creates the condition for interaction between its main components, an interaction which must be located at the erythrocytes-plasma interface The question then arises whether conditions occur somewhere or at some time in the body which raise the suspension stability of the blood in the same way as this happens in stationary blood in vitro. In other words, has the organism some mechanism which brings about a temporary, but sufficiently long separation of the erythrocytes and the plasma, for the chemical changes which cause stabilisation to take place in the corpuscles, or in the blood fluid, or in both ?

The Spleen as a Reservoir of Blood

As is well known, it was Barcroft (1926) who gave new life to the waning interest in the physiology of the spleen by the rediscovery and rapid advancement of our knowledge of the spleen's function as a reservoir of blood. The significance of this function seemed to be that the organism had at its disposal a reserve of blood which could be mobilised during bodily exertion. This view was confirmed by the fact that the concentration of hæmoglobin was greater in the reservoir blood of the spleen than in the circulating blood But many have asked (Lauda 1933) whether the whole complicated anatomical structure of the spleen, which has no analogy in any other organ, has no other physiological task than to increase the quantity of circulating blood by what, in human beings at least, can only be a small percentage

The difficult problem in the anatomy of the spleen has been its vascular system, together with the closely allied question of the blood's histological whereabouts in the spleen reservoir. Hueck's (1928) idea, the leading one not long ago, was that there could be two ways of circulation of the blood One would be a closed circulation, with a direct connexion between the arterial capillaries and the venous sinuses, to which the circulation would be limited when the spleen was not acting as a reservoir. The open circulation, on the other hand, would be something peculiar to the spleen. By this the blood would pass from the arterial capillaries directly into the intercellular spaces of the pulp, where it would be stored while the spleen acted as a reservoir An important point in Hueck's idea of the spleen's circulatory system was the assumption that the same anatomical units, by transforming themselves, could produce both a closed and an open circulation.

The Spleen as a Separator of Blood

Knisely's (1936) conception is very much simpler but nevertheless surprising. He experimented on living spleens of mice, rats, and cats. Microscopical examination of the blood flow shows that all the arteries open into the venous sinuses, which are linked with the smallest branches of the arteries and of the veins in the same way as ordinary capillaries The circulation in this closed system is regulated by contractions of sphincters situated on the arterial and venous sides of the venous sinuses. The cycle for the blood's passage through the spleen can be said to begin by the closing of the sphincter on the venous side of a venous sinus As a result of this the venous sinus begins to fill with blood and to be distended Simultaneously a separation of the blood's main components takes place, because the blood fluid passes through the walls of the venous sinus to the intercellular spaces of the pulp. When the sinus is completely filled with red corpuscles, the sphincter on the arterial side shuts, and the corpuscles now lie freed from the blood fluid for a shorter or longer time, which in certain cases has been observed to last ten hours. Afterwards the sphincter on the venous side opens again, and the sinus empties into the veins its content of red corpuscles, which thus rejoin the circulating blood

The ordinary histological pictures of the spleen with masses of red corpuscles in the intercellular spaces of the pulp are completely misleading, according to Knisely, and are due to the fact that in the dead or dying spleen the walls of the venous sinuses become impaired and allow the red corpuscles to pass through

The essentials of Knisely's conception are (1) that the blood's main components are separated in the spleen because the walls of the venous sinuses form a filter, through which the blood fluid passes, while the erythrocytes do not, and (2) that the erythrocytes lie packed in the venous sinuses and separated from the blood fluid for long periods In other words, conditions seem to be created in the spleen which ought to produce changes similar to those which take place when red corpuscles are warmed separately in vitro.

ALTERATIONS OF RED CORPUSCLES IN THE SPLEEN

Some earlier observations definitely support the suggestion that the suspension stability of the blood increases during its stay in the spleen. Thus, Hammarsten (1883) said that the red corpuscles in the spleen's blood were less flattened than those in the arterial blood, and that they had a smaller diameter—in other words, that they showed a relative spherocytosis. The correctness of this observation has been confirmed by Bergenhem and Fåhræus (1936) by comparing arterial blood and blood from the splenic vein under conditions which made certain that the latter was reservoir blood About the same time Heilmeyer (1936) substantiated by direct measurement that the erythrocytes become more spherical during their passage through the spleen.

Further, Hammarsten (1883) said that the red corpuscles of the blood in the splenic vein showed

reduced rouleaux formation On my advice Berglund (1930) investigated the sedimentation rate of the blood in the spleen of horses and found on the whole a much lower rate than in arterial blood Similar experiments were carried out later in cats by Mellgren (1936), with extra precautions which assured that actual reservoir blood was used, whereas the reaction with blood from the splenic vein was carried out with the same quantity of red corpuscles as in arterial blood The conclusion can definitely be drawn from Mellgren's experiments that not only the sedimentation rate but also the rouleaux formation is less in splenic blood than in arterial blood At present it is not easy to decide whether these changes of the corpuscles in the blood of the splenic vein are direct —i.e., due to the "deplasmatised" corpuscles packed in the venous sinuses being primarily stabilised— or whether they are partly indirect—i.e., due to adsorption of the stabilising substance (lysolecithin) which is formed in cell free plasma in the intercellular spaces of the pulp To what extent plasma free from red corpuscles is stored in the spleen is not clear, but it seems likely that deplasmatised erythrocytes are stored in greater quantities and longer than is the case with cell free blood fluid It is therefore probably also true that the stabilisation of the blood of the splenic vein is principally due to primary changes in the erythrocytes

Hæmolysis due to Separation of Blood in the Spleen

It has long been believed that the spleen plays an important part in the physiological destruction of red corpuscles, which must be assumed to go on in the organism on a large scale At one time it was considered that the red corpuscles were destroyed in the spleen by phagocytosis Since Knisely (1936) has pointed out that the little we see of phagocytosis is either an agonal or a post mortem phenomenon, this theory can be completely discarded

The other possible method of destruction of the red corpuscles in the spleen is hæmolysis, but there is no direct evidence For this reason Mellgren's (1939) experiments on splenic hæmolysis in cats are important He found in the blood of the splenic vein, which came from the emptying of the splenic reservoir, a weak hæmoglobinæmia, which was soon much increased by continued hæmolysis in vitro, whereas in samples of blood from other parts of the vascular system this did not happen The result of Mellgren's experiments can hardly be interpreted otherwise than that in the spleen hæmolytic or, more correctly, pre hæmolytic properties are given to the blood's main components, separated in the organ, and that hæmolysis takes place when they unite

ENLARGEMENT OF

If the spleen's hæmolytic [illegible] own to be directly connected [illegible] and reservoir function, there sh[illegible] can rallel between hæmolysis and en[illegible] teen— i.e., that kind of enlargemen[illegible] to the development of granulation [illegible] r tissue but to an increased amount of b[illegible] ertainly the case to a large extent I [illegible] especially of the two physiological conditions [illegible] n erythrocytes are destroyed in increased quantities Thus the destruction of erythrocytes in the newborn infant produces the well known icterus neonatorum Akerrén (1939) has proved that an enlarged spleen is found more often at this time than during the infant's subsequent development The other state accompanied by an increased physiological hæmolysis is pregnancy, during which the spleen is enlarged in human beings and many animals because of hyperæmia (Seitz 1927), which certainly means nothing else but increased reservoir function

There is also a pathological condition in which the conception that hæmolysis is a consequence of the separator and reservoir function of the spleen may be of etiological significance—namely, hereditary hæmolytic jaundice Naegeli (1931) and others have held that the characteristic changes in the erythrocytes—i.e., spherocytosis and reduced resistance— are the primary and essential cause of the disease Others, however, especially Moulengracht (1918), have contended that the primary cause is the enlarged spleen Moulengracht believes that the reduced resistance of the red corpuscles must be due to adsorbed hæmolytic substances, normally formed in the spleen, which in hæmolytic jaundice are produced there in increased quantities Nothing has been found in the spleen in hæmolytic jaundice to contradict the assumption (Gripwall 1938) that, in this disease, it is a question of increased activity in the separation and storing of blood with consequently increased hæmolysis, as a result of the enlargement of the spleen In this way not only the anæmia but also the spherocytosis in hæmolytic jaundice can be explained

Reduction of Erythrocytes-plasma Interface in Circulating Blood

The alteration of the blood, which the spleen causes by separating the blood's two main components, can be explained in another way as due to the more or less complete removal of the erythrocytes plasma interface The relative size of this interface can also be varied in the circulating blood by two different mechanisms, of which one is easy to understand and, as Bergenhem (1939) proved, easy to demonstrate experimentally in vitro

It is a priori clear that a certain quantity of erythrocytes in the circulating blood is necessary to hinder the stabilising process of the plasma or to neutralise its effect Bergenhem's experiments on how artificial samples of blood with different proportions of erythrocytes behave when kept flowing at body temperature in vitro seem to indicate that blood with a normal number of red corpuscles remains unchanged, whereas blood with fewer corpuscles is stabilised The analogy in vivo to this experimental observation in vitro is probably the fact that one finds as a rule a lower sedimentation rate in secondary anæmia than would be expected from the composition of the plasma proteins and from the hydrodynamic effect exerted by an oligocytæmia of higher degree in increasing the sedimentation rate This was pointed out by Westergren (1924) and can now be interpreted, in my opinion, as an expression of the stabilisation of the blood in anæmia by so much adsorption of the stabilising substance formed in the blood fluid that the few corpuscles cannot neutralise it Another fact pointing in the same direction is that the red corpuscles in secondary anæmia show a relative spherocytosis (von Boros 1937, Heilmeyer 1936)

It is of interest to remember that an important reduction of the number of erythrocytes is complicated by certain disturbances in the blood's lipoid metabolism The so called bleeding lipæmia in rabbits, discovered by Boggs and Morris (1909), appears as a result of repeated blood letting, after the number of corpuscles has gone down to about 30 per cent of the normal A similar lipæmia on two

be produced by methods that cause an intravascular hæmolysis with a like reduction in the number of corpuscles It appears from Starup's (1937) experiments that lipæmia of this kind is quickly stopped by giving the anæmic animal transfusions of red corpuscles If one does not assume with Starup that the oligocytæmia produces lipæmia through diminution of the blood's capacity to carry oxygen one must hold that it is due to a relative diminution of the area of the erythrocytes-plasma interface.

DECREASED SUSPENSION STABILITY OF BLOOD

I now pass over to the other mechanism, by which the erythrocytes-plasma interface can be reduced *without* a reduction of the quantity of corpuscles. It is clear that the increase in the sedimentation-rate of the red corpuscles in pregnancy and many pathological conditions has of itself no biological importance, but it may be otherwise with the phenomenon that causes the increased sedimentation-rate—i.e., the increased rouleaux formation This is not an extravascular phenomenon The sedimentation-rate undergoes variations in the vascular system as large as those produced in vitro. I need only call to mind that large clots of fibrin in the heart and the large vessels are only found in those pathological conditions in which the sedimentation-rate is considerably higher than normal owing to intensified rouleaux formation. The different rates of intravascular sedimentation can also be shown experimentally in healthy persons, pregnant women, and patients by puncturing a superficial vein in which the blood-stream is brought to a standstill and afterwards kept vertical for some ten minutes.

More important, however, is the fact that rouleaux certainly exist in the wholly intact blood-stream. From microscopical examination of suitable skin capillaries it has long been known that there is in certain cases a granular flow—*körnige Strömung*. German authors have wrongly explained this as due to rapid intermittent contractions in the arterioles. The granular flow is simply evidence that the red corpuscles are being transported in the blood-stream in an aggregated state It is easy to convince oneself that there is a pronounced parallel between the degree of granular flow and the sedimentation-rate.

It is thus certain that the erythrocytes in patients with a high sedimentation-rate are aggregated into rouleaux, probably in a large part of the blood. This means that the total erythrocytes-plasma interface in all such cases is reduced.

Rouleaux formation produces an especially effective reduction of the erythrocytes-plasma interface. If we reckon that a red corpuscle is a short cylinder of diameter 8μ and height 2μ, each corpuscle has a surface of 150·8 sq. μ and ten free corpuscles have a surface of 1508 sq. μ If, on the other hand, these ten corpuscles build a rouleau, their total free surface decreases to 603 sq. μ It seems likely that the disk-form of the red corpuscles is biologically important in that it makes possible large variations in the size of the erythrocytes-plasma interface It need hardly be pointed out that the erythrocytes-plasma interface, decreased through rouleaux formation, is not for any length of time formed by the same external parts of the same corpuscles The rouleaux are continually being broken and re-formed, but this does not prevent the interface at each moment from being of a certain size, which (with equal numbers of corpuscles of the same size) depends only on the degree of the blood's suspension stability.

When the erythrocytes-plasma interface decreases in pregnancy and in infection, it can be postulated, in my opinion, that large parts of the circulating blood are exposed to somewhat the same influence as the reservoir blood of the spleen I believe, therefore, that enlargement of the spleen and the reduction of the blood's suspension stability are related reactions, whose simultaneous appearance in pregnancy and in infections is not a mere coincidence

The intensified rouleaux formation, which is caused by the increase of the fibrinogen and serum-globulin fractions of the plasma (Fåhræus 1921) promotes the sedimentation of the red corpuscles to such a degree that any influence exerted by the stabilisation process, as a consequence of the diminution of the erythrocytes-plasma interface, is very probably masked and difficult to elucidate

One may ask if this second way of reducing the erythrocytes-plasma interface—i.e., rouleaux formation—is, like the above-mentioned oligocytæmia, also connected with similar disturbances of lipoid metabolism. This is clearly not the general rule, for in many infections which show a higher sedimentation rate there is no lipæmia However, *special factors* may come into play, especially fever, which, according to Ewert's (1935) experiments, considerably reduces the level of blood-cholesterol; but in fever-free conditions with reduced suspension stability it is tempting to draw the above analogy. Nephrosis is a fever-free condition with usually a very high sedimentation-rate and pronounced lipæmia During pregnancy a lipæmia appears, which shows a pronounced parallel with the sedimentation-rate. Concerning the cause of lipæmia in pregnancy there are, as Boyd (1934) pointed out, no less than fifteen different theories Herewith I put forward the sixteenth: that the alteration of the fat-metabolism of the blood during pregnancy is due to a decrease of the erythrocytes-plasma interface, which is very probably a significant manifestation of the decreased suspension stability of the blood.

Summary

(1) Erythrocytes and plasma, kept separate from each other, undergo—by what is called the stabilisation process—changes, which as regards the erythrocytes consist in decreased rouleaux formation and spherocytosis—alterations in direction of hæmolysis—and as regards the plasma in the formation of lysolecithin by a serum-lecithinase similar to that in cobra venom

(2) These changes take place in the spleen—the separator of the blood—at least as regards the erythrocytes, which are kept for long periods deplasmatised in the venous sinuses of the organ (Knisely 1936), but probably also as regards the plasma, and hæmolysis takes place when separated blood components reunite in the splenic vein

(3) The fact that the circulating blood maintains its properties depends on the fact that the stabilisation process in the erythrocytes is prevented or its effect neutralised by the plasma and vice versa —an interaction which must be located at the erythrocytes-plasma interface

(4) The area of this interface may be diminished not only in the spleen but also in the circulating blood, with effects upon its fat-metabolism. This may occur either by the reduction of the number of erythrocytes or by increased rouleaux formation—the intravascular phenomenon which causes the increase sedimentation-rate in diseases and pregnancy.

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"INFLUENZAL" MENINGITIS
TREATED WITH M & B 693
REPORT OF TWO CASES

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The treatment of "influenzal" meningitis with drugs of the sulphonamide group has been reported by Teggart (1938), Young and Moore (1938), and Taylor (1938) In two cases recovery followed We can trace no record of "influenzal" meningitis treated with M & B 693, which prompts us to report the following two cases

CASE RECORDS

Case 1.—A boy, aged 17 months, was admitted to the Auckland Hospital on March 2, 1939 For three weeks before admission he was somewhat fretful, but this was attributed to teething Two days before admission there was a definite history of exposure to chill, and the next day malaise, cough, and conjunctivitis were noted

On admission the temperature was 103° F, pulse-rate 160, and respiration-rate 71 (sleeping) The only signs present were coryza, conjunctivitis, and scattered rales throughout both lungs, suggesting acute influenza with incipient pneumonia On the basis of this diagnosis treatment with M & B 693 was promptly instituted

When seen by one of us (E H R) two days after admission (fourth day of illness), the temperature was 104° F, pulse-rate 170, respiration-rate 70, and he looked seriously ill Conjunctivitis was still present, but there were no signs of bronchitis or pneumonia The ears were normal and the throat only slightly injected There was no rigidity of neck or back and no Kernig The only other features noted were undue brightness of the eyes and general irritability There were no definite signs of meningitis, but in view of the irritability and the unexplained ill appearance of the child a lumbar puncture was done forthwith The cerebrospinal fluid (C S F) was under increased pressure and turbid There was a definite increase of globulin The films from the centrifuged deposit showed pus and a few gram negative bacilli These were mainly intracellular, as many as six bacilli being found within one polymorph cell Cultures grew *Bacillus influenzæ*

Treatment and progress.—On the second day of illness—i.e., on admission—M & B 693 was exhibited, the total for the first twenty-four hours being 2·5 g, of which probably 0·5 g was vomited On the third day, because of gastric intolerance, the dose was reduced to a total of 1·75 g, but vomiting still continued On the fourth day, after the first lumbar puncture, it was realised that much larger doses would be needed, and in view of the importance of nutrition further vomiting could not be permitted The drug was therefore suspended in sterile olive oil (1 tablet to 2·5 c.cm.) and given by intramuscular and subcutaneous injections mainly into the anterior abdominal wall The methods of suspension in water and in normal saline, described respectively by Somers (1939) and Bryant and Tairman (1939) were not then known to us The total dose on the fourth day was 1·5 g

On the fifth day 3 g of M & B 693 was injected, and the C S F was still turbid On the sixth day 1·75 g was given, the C S F was much clearer and cultures were sterile The haemoglobin was 9·05 g per 100 c.cm., and the leucocyte count 13,700 A small intravenous transfusion of 4 oz of blood with 4 oz of saline was then given On the seventh day the haemoglobin had risen to 12·1 g per 100 c.cm. and the leucocyte count to 23,000 In view of this good result a further 6 oz of blood with 7 oz of saline was then given The child was still very irritable, and a definite Kernig's sign and neck rigidity had developed On the seventh and eighth days a mistake was made in the dosage of M & B 693, so that on each of these days only 0·13 g was given This error was rectified, however, and during the next five days the total dosage amounted to 9·5 g

On the thirteenth day Dr C R Burns saw the case in consultation, the point at issue being the continuance or not of administration of M & B 693 On the one hand, the C S F had been sterile for seven days, and the injections were beginning to distress the child, on the other hand, the temperature was still 101·6° F and pulse-rate 156, and definite signs of meningeal irritation (Kernig's sign and rigidity of the neck and back) were still present The total dosage of the drug, allowing for losses by vomiting, had been 18 g.—i.e., just over 0·75 g per lb of body-weight In view of the big dosage and its long duration (twelve days) and the probable further absorption from the oily suspension during the next few days it was decided to stop the administration of M & B 693 and to watch developments

On the fifteenth day the C S F was clear and colourless and contained only twelve cells per c.mm On the twentieth day the child was sitting up, with a normal temperature, and on the twenty-seventh day he was beginning to stand There were no physical signs, and the C S F was normal except for a slight increase of pressure On the thirty-first day he contracted an upper respiratory infection with a spike of temperature, but this quickly subsided, and he was discharged completely well on the forty-second day When seen two months later the child was normal in every respect

Summary of case 1.—A boy, aged 17 months, whose illness was diagnosed on the second day as severe influenza and on the fourth as influenzal meningitis Treatment with M & B 693 was begun on the second day and continued without interruption till the thirteenth day The drug was administered orally for the first two days and subsequently by injection of an oily suspension The total quantity given was 18 g (0·75 g per lb of body weight) Periodic examination of the haemoglobin and leucocytes in the blood was made, and two blood transfusions were given Lumbar puncture for the purpose of drainage was performed daily for three days during the period of maximal dosage of the drug and subsequently for diagnostic purposes on two

Continued from previous page

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occasions The C S F. was sterile on the sixth day of the illness, and thereafter the patient made a complete and uninterrupted recovery (see fig 1).

CASE 2.—A girl, aged 12 years, first complained of frontal headache on March 19, 1939. On the following day she vomited several times and the headache became severe. On the 21st her temperature was 104° F., and she complained of stiffness at the back of her neck, and any movement induced headache. These symptoms persisted, and when she was seen on the 22nd by one of us (J. E. C.) the pulse-rate was 112, temperature 104° F., respiration-rate 20, and she was in a state of toxic delirium. She was confused and disorientated as to time and place and lay curled up in bed with knees drawn up and head somewhat extended The ocular fundi were normal, and the pupils were 6 mm., equal, and regular, and reacted briskly to light. Ocular movements were full in all directions, and there was no diplopia, nystagmus, or strabismus. The fifth cranial nerve presented no abnormalities, and there was no weakness of the facial muscles. The remaining cranial nerves presented no abnormalities. The deep reflexes were present and equal The tone of the lower extremities was moderately increased, the power was reduced, and coordination was unimpaired. The deep reflexes were brisk and equal, the plantar responses being flexor. There was definite rigidity of the posterior cervical muscles. The back was held rigidly, and the patient resented any attempt at flexion Kernig's sign was obvious in both lower extremities. The ear-drums were normal, and the throat was moderately congested.

Lumbar puncture revealed a slightly turbid fluid with an opalescent appearance and under a pressure of 240 mm The fluid contained many pus cells and gram-negative bacilli, and the globulin was increased. On culture there was an abundant growth of *B. influenzæ* The urine contained a small amount of albumin but no pus or organisms

Treatment and progress—On March 22 (the fourth day of the illness) meningitis was diagnosed and treatment with M. & B. 693 begun immediately Four tablets (2 g.) were given at 5 30 P.M. and repeated at 8 30 P.M., and thereafter two tablets were ordered two-hourly. In the first seven hours the patient received 6 g. of M & B. 693, and at this stage there was no intolerance to the drug. During the first night she was restless, delirious, and incontinent of urine.

On the morning of the 23rd she was clearer mentally. The temperature was 102 4° F., pulse-rate 94. The administration of M. & B. 693 was continued in the same dosage (two tablets two-hourly) By 9 P.M the temperature had fallen to 98° F., pulse-rate 84. Twenty-four tablets were given in the twenty-four hours. On the 24th at 5 A.M. the temperature was 97 8° F., and pulse-rate 72, but during the morning the patient became restless, and the temperature rose to 100° F. During this day the tablets were reduced to two four-hourly (twelve tablets in the day) Lumbar puncture showed a turbid opalescent fluid under pressure of 180 mm and 30 c cm. of spinal fluid was removed. A blood-count gave the following result:

Red cells	5,470,000	Polymorphs	62 %
White cells	13,150	Lymphocytes	30 %
Hæmoglobin	96 %	Monocytes	8 %
Colour index	0 89		

On March 25th her mental condition had improved, and she was taking fluids well. There was moderate cyanosis. The two tablets of M. & B. 693 were given four-hourly (twelve tablets in the day) The temperature was 101° F. at 7 P.M., and 15 c cm. of opalescent fluid was removed by lumbar puncture. On the 26th her condition had improved, nourishing drinks were being taken well, and her diet was increased. The temperature during the day fell from 101° F. to 99 2° F. M. & B. 693 was given as before (twelve tablets in the twenty-four hours).

On March 27th the patient complained of backache and headache, and the temperature rose to 102° F. It was decided to do a further lumbar puncture to relieve the headache, and 30 c.cm. of turbid opalescent fluid was removed and the headache somewhat relieved. The fluid showed only a moderate number of pus cells and a few gram-negative bacilli, most of them lying within the polymorphs. The administration of M. & B. 693 was continued in the same dosage (twelve tablets in the twenty-four hours) A blood-count showed red cells 4,620,000 hæmoglobin 82 per cent (12 g. per 100 c cm.), colour-index 0 9, and leucocytes 18,000.

On the 28th the temperature fell to normal. The administration of M. & B. 693 was continued for sixteen hours (eight tablets). At this stage the patient was much improved. She was moderately cyanosed In six days she had had 47 g. (ninety-four tablets) of M. & B. 693, had shown remarkable tolerance, and had not vomited Our lack of facilities for the estimation of the content of the drug in the blood and C S F is the main justification for such massive dosage in this case. The drug was discontinued at this stage

On March 29 lumbar puncture showed turbid fluid with an obvious increase of globulin. Films of the centrifuged deposits contained pus cells and a few gram-negative bacilli. Culture produced an abundant growth of *B influenzæ* It was decided at this stage to give another salt of the sulphonamide group. Proseptasine was given (two tablets four hourly for six doses) On the 30th the patient had a very comfortable day, but the temperature rose to 101° F. and the pulse-rate to 112. Proseptasine was discontinued after 6 g. had been given. On the 31st she was quieter and very drowsy. Temperature 103° F., pulse-rate 116 She was troubled with the passage of very offensive flatus

On April 1 the temperature was 102° F., and, since the C S.F. was still turbid and contained gram-negative bacilli and pus cells, it was decided to administer M & B 693 in big doses. Between 3 30 P.M. and midnight twelve tablets were given. The

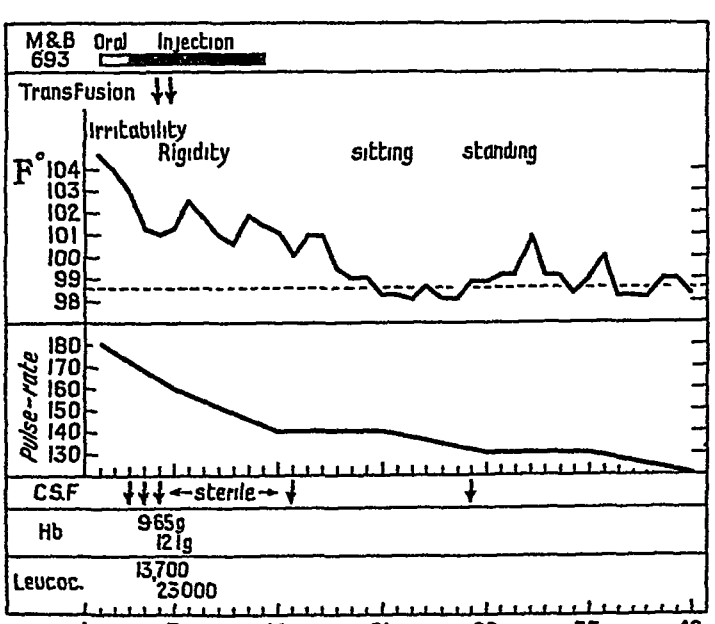

FIG. 1—Progress of case 1. C S F. arrows = lumbar puncture.

patient became moderately cyanosed and restless and vomited during the night. This was the first time vomiting had occurred since the start of treatment. At this stage the case was seen by Dr. L. Ludbrook, and it was decided to give a blood transfusion (200 c.cm.) and 5 c.cm. of the patient's father's serum intrathecally to add complement to the C.S.F.

M. & B. 693 12 g. was given on the 3rd and 6 g. on the 4th, and then administration of the drug was discontinued. Lumbar puncture showed the fluid to be under pressure of 140 mm. It was slightly turbid and contained an increased amount of globulin (334 pus cells per c.mm.), but no organisms were seen, and cultures were sterile after forty-eight hours. A blood-count gave the following result —

Red cells	3,410,000
White cells	11,150
Hæmoglobin	68%
Colour-index	1
Polymorphs	70%
Lymphocytes	24%
Monocytes	4%
Eosinophils	2%

On the 5th the temperature rose to 102° F. A blood transfusion of 350 c.cm. was given. Lumbar puncture on the 6th revealed a turbid fluid under pressure of 100 mm. It contained pus, increased globulin, and an occasional gram-negative bacillus. The temperature was 103° F. and the pulse-rate 110. On the 7th and 8th the temperature fell to 99° F. but rose again to 101° F. on the 9th. It was decided to administer M. & B. 693 once more. During the day twenty-four tablets were given, but the patient became moderately cyanosed, cold, and very nauseated. During the day she vomited four times. A mixture of bismuth and soda was given with the tablets, but in spite of this she continued to vomit at intervals until midnight, so administration of the drug was discontinued.

For the following four days the temperature was normal. The pulse-rate was 80–110. During this time the patient took nourishment well. On the 15th, 16th, and 17th there was a slight rise of temperature to 100° F. The blood count on the 17th gave the following results —

Red cells	4,100,000	Polymorphs	58%
White cells	8300	Lymphocytes	38%
Hæmoglobin	85%	Monocytes	4%
Colour-index	1·03		

The temperature continued to swing daily to 100–101° F., and on the 21st it was decided to give more M. & B. 693 (two tablets six hourly) for the C.S.F. still contained an increased amount of cells, and on culture there were a few colonies of *B. influenzæ*. By the 24th the temperature had fallen to normal, although the pulse-rate remained high (100–120).

From this time the patient made an uninterrupted recovery. The pulse-rate fell to 70–80, and on May 5 there was no rigidity of the neck muscles and there was very little stiffness of the hamstring muscles and back muscles. The patient was bright and eating well. The C.S.F. was at a pressure of 110 mm. and was colourless. There was slight increase of globulin. No organisms were seen, and cultures were sterile. The patient was discharged on the 13th, and since that date has rapidly improved and is gaining weight. All rigidity of the back and legs has disappeared, and she has shown no evidence of sequelæ.

Summary of case 2.—A girl aged 12, whose illness was diagnosed on the fourth day as influenzal meningitis, was treated with M. & B. 693 (106 g.) and proseptasine (6 g.), which were exhibited in five "bursts" of treatment. The treatment was controlled by periodic blood counts and examinations of the C.S.F. Gastric tolerance to the drug at first was good, but subsequently vomiting occurred frequently. Blood transfusion was used twice, and on one occasion human serum was added to the C.S.F. in an attempt to supply complement. The patient made a complete recovery. On the forty-sixth day of the illness the temperature and pulse-rate were normal, and the C.S.F. was sterile (*see fig. 2*).

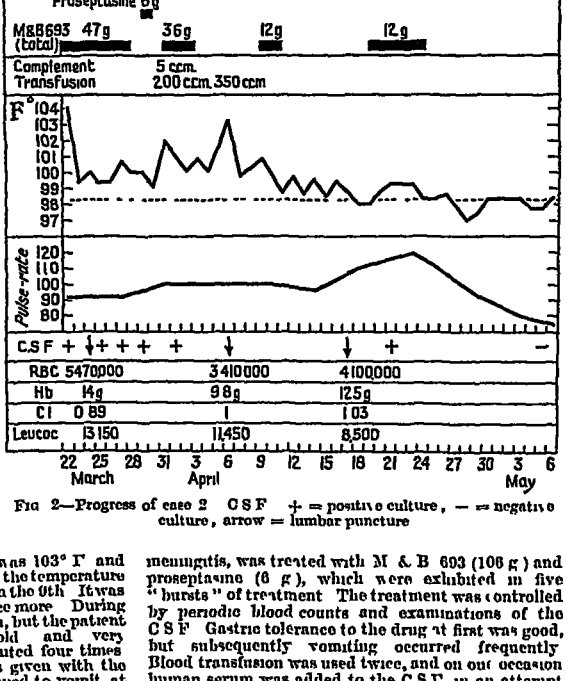

FIG. 2—Progress of case 2. C.S.F. + = positive culture, − = negative culture, arrow = lumbar puncture.

COMMENTS

Lumbar puncture.—The therapeutic value of frequent lumbar puncture has been questioned by Banks (1938) and by McAlpine and Thomas (1939) in discussing a case of pneumococcal meningitis. These workers believed that excessive drainage of the C.S.F. might be a factor in promoting the formation of adhesions round the lower brain stem with subsequent hydrocephalus, and that it lowered the concentration of the chemotherapeutic drug and so reduced its effect. If the pressure is reduced to such an extent as to allow the base of the brain to press upon the meninges surrounding the foramen magnum, the danger of subsequent adhesions seems to be very real, if, however the pressure is maintained above the normal level we suggest that this danger is very small. The effect of the lumbar puncture on the concentration of any drug in the C.S.F. must depend on whether the drug is still being administered in full doses and on its maximal concentration maintained in the blood. We suggest that during the period of administration of M. & B. 693 any C.S.F. withdrawn will be quickly replaced by fresh fluid containing the same concentration of the drug, and in that case the removal of bacilli and toxins from the intrathecal space must do good. When, however,

the administration of the drug has been stopped, lumbar puncture should be avoided, except for purely diagnostic purposes, and then only a minimal quantity of fluid should be withdrawn.

Transfusion and complement—In both of our cases a blood-transfusion was given twice, and we are satisfied that this played a part in the recovery of these two patients. We believe the value of transfusion to lie chiefly in the treatment of the hæmolytic anæmia induced by the sulphonamides It might be thought that the transfusion of fresh blood would add complement to the C S F However, the work of Finland et al. (1938) suggests that the C.S F. contains no complement, so that by adding complement to the blood-stream we can only assist during the septicæmic stage of the disease. In view of Finland's findings, in case 2 we gave human serum intrathecally in an effort to add complement McIntosh and Whitby's (1939) work suggests that the sulphonamides act by "neutralisation of some metabolic function or enzymatic activity of the organisms" and do not actively destroy them, so that by adding complement we hoped to aid the natural immunity of the body which must go hand in hand with the action of the sulphonamides We were unable to assess the value of intrathecal complement, for its administration coincided with treatment with the drug and with the first transfusion.

M & B. 693—In view of the almost uniformly fatal course of influenzal meningitis in children, the recovery of two consecutive patients, one of whom was only 17 months old, cannot reasonably be ascribed to coincidence Apart from lumbar puncture and blood-transfusion, whose inadequacy has been so conclusively proved in the past, the only treatment common to both cases was the administration of M. & B. 693 These considerations, together with the impressions gained from observation of the cases, compel us to believe that the good results obtained were pre-eminently due to this drug

We wish to thank Dr W. Gilmour and Dr. E. Fowler for kindly performing the pathological investigation, and Dr. L Ludbrook and Dr. C. R. Burns, with whom we consulted frequently.

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"... The value of examinations as a test of knowledge is debatable; but it seems probable that much of the criticism levelled at the examination system should be directed, more properly, against unskilled examiners, who bring the system into disrepute by setting stupid papers and asking ambiguous questions A well-conducted examination is a good test of knowledge and, what is even more important, constitutes a potent stimulus to effort on the part of the examinee It is therefore desirable to hold an examination at the end of the first and of the second year of the course, though the system might be strengthened by the furnishing of reports from demonstrators in charge of the various groups of students upon the work done by each man during the year Due consideration should be given by the examiners to these reports, which would be of special value in the examination at the end of the first year, if, as has been urged, this should be regarded as a means for elimination of the unfit."—Sir ALAN NEWTON, *Med J Aust* July 15, 1939, 91.

VALVULAR PNEUMOTHORAX

TREATED BY MECHANICAL VALVE AND OBLITERATIVE PLEURISY

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AN analysis made by Perry (1939) of cases of spontaneous pneumothorax shows that 70 per cent. are non-tuberculous and I have the impression that my experience confirms this preponderance of non-tuberculous cases Nevertheless, before assuming that the perforation is of non-tuberculous origin, every investigation must be made, including an inquiry into preceding malaise, loss of weight, hæmoptysis, examination of sputum and fæces for tubercle bacilli, temperature at 6.30 P M, sedimentation-rate, and a careful scrutiny of the radiogram.

One principle of the treatment of non-tuberculous spontaneous pneumothorax, where special treatment is needed, (*a*) because of a persisting simple or valve perforation or (*b*) because of recurrent attacks, is the production of an aseptic irritation of the pleura and a small fibrinous effusion to start obliterative pleurisy The other principle, applicable to high-pressure spontaneous pneumothorax, is a simple valve mechanism This article describes the combination of these two principles in the management of high-pressure pneumothorax.

INDUCED OBLITERATIVE PLEURISY

The re-expansion of the collapsed lung, which can be obtained by the injection of a 5 per cent solution of Gomenol in olive oil into the pleural cavity and by the consequent induction of obliterative pleurisy in spontaneous pneumothorax with a persistent perforation, has already been described (Chandler, 1938).

Gomenol is the irritant used, because its action on the pleura is well known It is safe if used cautiously. There is no exact dosage. Not much must be given at first, otherwise the reaction may be too severe; nor must the dose be increased too gradually, lest the pleura become accustomed to the oil and so not react. The suggested dosage is 2 c cm of a 2 per cent solution, followed by 5 c cm. of a 5 per cent. solution, 10 c.cm of a 10 per cent solution, and 20 c.cm. of a 20 per cent. solution. If the pleura does not then react, sodium morrhuate or else iodine might be used, but I have no experience of the use of these in the pleural cavity in spontaneous pneumothorax.

Induced obliterative pleurisy has been employed in a case of recurrent spontaneous pneumothorax.

CASE 1.—A man, aged 30, was referred to me by Dr. R. R. Fells after having had his tenth spontaneous pneumothorax. They had developed on each side at different times, being brought on by the most trivial action. When I first saw him he had a left-sided pneumothorax which was almost absorbed. I therefore advised that obliterative pleurisy should be induced on the next occasion to prevent further attacks.

Within eight weeks he had a spontaneous pneumothorax on the right side and was admitted to the London Chest Hospital. Thoracoscopy to discover the cause of the ruptures showed no bullæ of any kind on the anterior and lateral surfaces of the lung, these being the only parts visible. The lung was very pink, and there were parallel horizontal lines of pigment running regularly over the visceral pleura, as though the lung were unnaturally voluminous and, when uncollapsed, pressed unduly against the ribs

and intercostal spaces Through the thoracoscopic cannula 5 c cm of a 10 per cent solution of gomenol in olive oil was injected and 1800 c cm of air withdrawn

The same afternoon the patient experienced pain at the right base and a temperature of 99° F , and the next day some pain and tenderness, with no change of temperature On the following day the pain had disappeared, the temperature was normal, and some fluid had appeared The next day the fluid slightly increased, and thenceforth the lung steadily and completely re-expanded

It is impossible to say yet whether a permanent result has been obtained nor how firm an adhesion between the two layers of the pleura is produced by this method One can only hope that no further spontaneous pneumothorax will develop on the right side If and when the next left sided pneumothorax appears, the treatment will be repeated on that side

HIGH PRESSURE PNEUMOTHORAX WITH VALVULAR TEAR

The utmost distress to the patient and the greatest anxiety in its management may be caused by high pressure pneumothorax with a valvular opening It may prove fatal Effective removal of the intrapleural air does not necessarily make the two layers of pleura adhere, and aseptic pleural irritation will not alone avail, for the rupture, acting as a one way valve, keeps the two layers of the pleura apart With every inspiration air comes out through the valvular tear into the pleura , with every expiration the valve closes and the air is imprisoned in the pleural cavity With the continued repetition of these alternate events the lung is kept completely collapsed, the mediastinum is grossly displaced, and the visceral and parietal layers of pleura cannot approximate and adhere together The two methods—the induction of obliterative pleurisy and the use of a valve mechanism—therefore must be used simultaneously A valve can be made with a thin rubber fingerstall in the closed end of which a slit has been made The valve in the fingerstall acts in exactly the opposite way to the valvular opening in the lung, it allows more air to escape into the atmosphere with each expiration than escapes from the lung into the pleural cavity with each inspiration, because the slit in the fingerstall can be made bigger than any probable tear in the lung, with the result that there *is no high positive* pressure in the pleural cavity In a short time more air escapes through the fingerstall than escapes through the tear in the lung , so the pleural space is almost emptied of air and the pleural layers can come together, whereupon the induction of obliterative pleurisy may cause them to adhere together

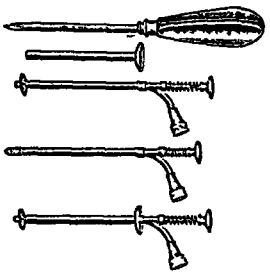

FIG 1—Mr Zachary Cope's self retaining cannula

The following case illustrates the points It is the first time that the Cope (1939) self retaining cannula (fig 1) has been used for this purpose *Canules à demeurer* were used over a century ago, especially between 1825 and 1845, for pleural effusions and empyemas, flaps of goldbeater's skin being used instead of rubber to form the valve at the opening of the cannula , so the conception of the valve mechanism is not new, but I think that the combination of methods is new

CASE 2 —On April 20, 1939, I was asked by Dr H J S Morton to see a man, aged 58, who on getting out of bed one morning had felt a severe pain in the right chest with breathlessness He had had to sit on the side of the bed for a time, but later he had gone down to breakfast He had remained in the house all day but on going to bed at night had suddenly become more breathless and cyanosed

The classical signs of spontaneous pneumothorax were found, and the patient was admitted to the London Chest Hospital, where radiography showed the heart considerably displaced to the left and practically complete collapse of the right lung (fig 2) The patient was distressed, very cyanosed, and dyspnoeic

On the 21st 2000 c cm of air was withdrawn, with only transitory relief, the pressures returning to 0 + 10 cm of water after two minutes More air was withdrawn later, with the same result

On the 23th a pneumothorax refill needle was inserted into the pleural cavity in the second space anteriorly, just external to the midclavicular line To the proximal end of the needle was tied a thin rubber fingerstall in the closed end of which a slit had been made At the same time 2 c cm of a 2 per cent solution of gomenol in olive oil was injected into the pleural cavity There was no reaction The valve acted excellently, and the heart returned to its normal position , but, owing to movements and cough the end of the needle worked out of the pleural cavity into the chest wall and surgical emphysema developed

On the 29th a long extrapleural pneumothorax-refill needle was therefore used This also became

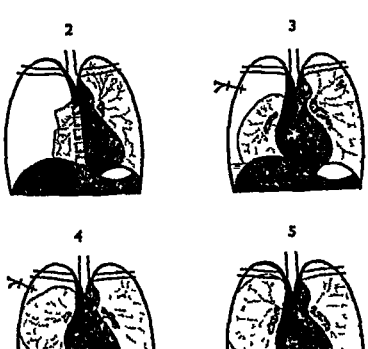

FIG 2 (case 2)—High pressure spontaneous pneumothorax with valvular tear, showing practically complete collapse of the right lung displacement of the heart towards the left side and partly beyond the spine, and displacement of the trachea

FIGS 3 and 4 (case 2)—Re-expansion of the right lung after the insertion of the self retaining cannula and the injection of gomenol

FIG 5 (case 2)—A month after the insertion of the cannula and the injection of gomenol, showing the right lung almost completely re-expanded and only a small residual pneumothorax

displaced, causing more surgical emphysema; moreover it caused pain and became blocked.

On May 2 Cope's self-retaining cannula was used, the fingerstall being tied over the curved outer end. At the same time 10 c.cm. of a 10 per cent. solution of gomenol in olive oil was injected into the pleural cavity. The temperature did not rise, but there was some malaise and some fluid appeared.

On the 3rd the fluid increased and the patient had slight nausea By the 13th the fluid had risen to the ninth rib posteriorly, and the lung was adhering to the diaphragm and approaching the chest wall.

From this time the lung began to re-expand steadily and became attached to the chest wall (figs. 3 and 4), and by the 12th fluid began to come through the cannula. This was therefore withdrawn on this day, with some anxiety lest the valvular opening should not have healed sufficiently firmly and the lung be stripped away from the chest wall. The patient was watched carefully, however, and nothing untoward happened. By the 18th the lung was touching the chest wall up to the third space in the midaxillary line, and the dome of the lung reached as high as the fourth rib posteriorly.

On May 21 the patient was allowed up, feeling and looking well, with the heart in the normal position Radiography on June 1 showed the lung to be almost completely re-expanded, with a small residual pneumothorax in the uppermost part of the pleural cavity (fig. 5).

The Cope self-retaining cannula acted perfectly. It remained in position eleven days without becoming displaced Occasionally fibrin blocked the lumen, but it was a very simple matter to remove the inner cannula, clean it, and replace it, a spigot being placed in the outer cannula meanwhile

The most strict aseptic and antiseptic precautions were taken The skin was kept clean with iodine and spirit and with acriflavine alternately, and the skin and the instrument were covered so far as possible with sterile dressings, leaving the fingerstall free. There was no infection of the fluid, the cannula track, or the skin. It was realised that infection was possible, but it was a risk that had to be taken. I believe that with care of every detail infection can probably be prevented

Theoretically the self-retaining rubber catheter might be used, but there are many objections to this: collapsibility, difficulty of cleaning if blocked, and difficulty with removal and reinsertion. With the Cope self-retaining metal cannula there are no such difficulties It might be possible to use a self-retaining rubber catheter passed through a cannula, the latter being retained permanently in position; but the catheter and cannula would have to be kept very small, and I doubt if the flange of a catheter so small would be strong enough to make it truly self-retaining. Nevertheless, in an emergency, if the Cope self-retaining cannula were not available, I believe it would be good practice to insert a stout self-retaining intercostal catheter with a fingerstall valve tied to the end This might be the best method in traumatic pneumothorax, especially under war conditions.

SUMMARY

(1) The value of induced obliterative pleurisy in non-tuberculous spontaneous pneumothorax, previously reported in a case with a persistent perforation (Chandler 1938), is reaffirmed.

(2) A case of recurrent spontaneous pneumothorax is described in which obliterative pleurisy was induced.

(3) In high-pressure spontaneous pneumothorax in a valvular rupture of the lung it is possible to bring about the conditions suitable for the induction of obliterative pleurisy by combining this method with the use of the Zachary Cope self-retaining cannula fitted with a mechanical valve (a fingerstall with a slit). A case is described in which this was done.

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IRON ADMINISTRATION AND HÆMOGLOBIN LEVELS DURING PREGNANCY

BY E. M. WIDDOWSON, B.Sc., Ph D.

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IT has been recognised for some time that the blood of normal non-pregnant women tends to contain less hæmoglobin than that of men (Price-Jones 1931, Widdowson and McCance 1936), and it has been suggested, in explanation of this fact, that women often have a mild but really pathological anæmia. To test this Widdowson and McCance (1936) gave iron to a group of normal men and women and observed their hæmoglobin levels The women's hæmoglobin tended to rise and approached the men's level; the men's hæmoglobin did not change This observation has been confirmed (Barer 1937, Sankaran and Rajagopal 1938), and from all we know of the metabolism of iron we may confidently attribute the rise to the absorption of inorganic iron. It has subsequently been found, however, that women's hæmoglobin persists at the higher levels only so long as iron continues to be administered (Barer 1937, Sankaran and Rajagopal 1938) This is a very important extension of the original observation, because iron once absorbed is not apparently re-excreted (McCance and Widdowson 1937, Widdowson and McCance 1937, McCance and Widdowson 1938) Why, therefore, should the hæmoglobin fall when the body probably contains more iron than it did while the hæmoglobin was rising? Why should it fall to a level lower than men's average level when the body contains far more iron than the average man's? Steenbock et al (1936) noted that differentiation in the storage of iron in male and female rats appeared with sexual maturity. Castration of the female led to decreased storage Injection of the follicular hormone into sexually immature female rats promoted greater storage than in the litter-mate controls. This is no new idea, for Bunge (1880) suggested that from puberty onwards the female stored reserves of iron for future needs of reproduction.

Children may respond to the administration of iron in the same way as adults. Mackay (1931) has recorded the prevalence of an anæmia at certain ages which can be cured with iron. It has also been noted that, if the administration of iron is stopped, the anæmia tends to recur (Josephs 1939, Mackay 1939).

The experiment here described was undertaken to obtain further evidence on this matter. It is well known that pregnant women are often anæmic, and, although probably the cause is not the same in all cases, it is generally admitted that the administration of iron will prevent the fall of hæmoglobin. It was therefore decided to study the hæmoglobin levels of pregnant

women before, during, and after periods of therapeutic medication with iron

INVESTIGATION

Hæmoglobin determinations were made by the Haldane method on 100 women, all of whom were 20 weeks' pregnant or less, attending the antenatal department of King's College Hospital, London. The determinations were repeated a month later. Then half the women (those attending on Wednesdays) were prescribed 1000 mg. of iron, as ferric ammonium citrate or ferrum redactum, daily for six weeks. The level of hæmoglobin in the capillary blood was determined at fortnightly intervals. The administration of iron was then stopped and the hæmoglobin estimated fortnightly until a week after delivery. The other women (attending on Tuesdays) were given no medicine, and their hæmoglobin levels were observed at monthly intervals until delivery and again a week later. In both groups an estimation was always made within twenty four hours after delivery. All determinations were made in duplicate by the same person, who did not know, while making the estimation, to whom any sample of blood belonged. At the end of the experiment it was decided not to consider (1) women whose babies were born before the thirty sixth week, (2) women who had taken the last dose of iron within eight weeks of delivery, and (3) women in the experimental group who had not taken the prescribed iron. After these omissions 31 women were left in the "iron" group and 44 in the control group.

RESULTS

The presentation of the results is complicated by the difficulty—common to so much biological work—that, whatever the stimulus, no two individuals ever react in exactly the same way. Averaging the results is unsatisfactory in that it tends to obscure exceptional individuals who may be giving important information. The policy adopted has been to mention the exceptional cases, to give the results of a few typical individuals of both the control and the experimental groups, and to give the averaged results of both groups.

In the control series some women's hæmoglobin did not fall with the progress of pregnancy, and a very few women showed a slight rise. The characteristic response was a tendency to fall steadily throughout pregnancy and to rise sharply after delivery (figs 1 and 3).

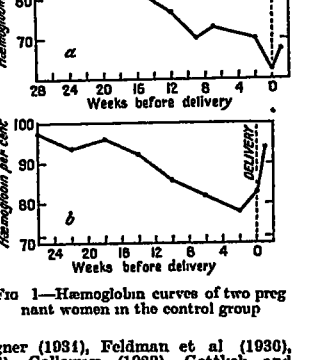

FIG 1—Hæmoglobin curves of two pregnant women in the control group

These results are in keeping with the work of Adair, Dieckmann, and Grant (1936), Bethell (1936), Bland, Goldstein, and First (1930), Boycott (1936), Dieckmann and Wegner (1934), Feldman et al (1936), Fullerton (1936), Galloway (1929), Gottlieb and Gottlieb (1930), Reid and Mackintosh (1937), Strauss and Castle (1932), Toverud (1935) and require no further comment.

The cause of the fall, although possibly in some cases the result of a true deficiency of iron (Davidson et al 1933, Mackay 1935), is probably largely due to a rise in the volume of plasma unaccompanied by a corresponding rise in the number of circulating red blood cells (Boycott 1936, Dieckmann and Wegner 1934, Feldman et al 1936, Strauss and Castle 1932, Thomson et al 1938). The phenomenon is not confined to humans (Beard and Myers 1933, Van Donk et al 1934).

The responses of the experimental group are much more complicated than those of the control because, besides the effects of pregnancy and delivery common to both groups, two further stimuli were in operation (1) the administration of iron, and (2) the cessation of its administration. The response to iron was not an instantaneous increase in all the women's hæmoglobin concentrations. A few of the hæmoglobin curves continued to fall, as though iron had not been given at all (fig. 2a); several showed a break in the fall but no real rise within the six weeks of medication (fig. 2b), and most of them rose, some very much more than others (figs. 2c and d). The cessation of administration of iron led almost always to a fall in the hæmoglobin level of those women in whom its administration had initiated a rise. Some of the women gave an indeterminate a response to the

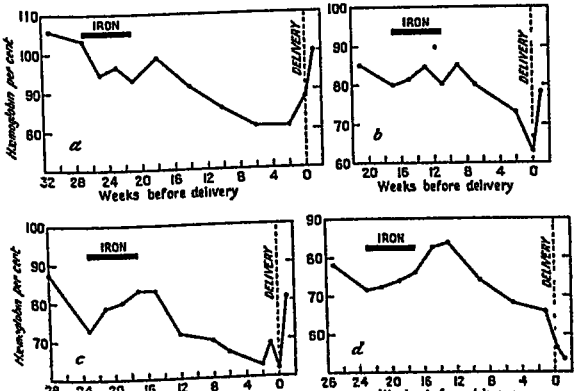

FIG 2—Hæmoglobin curves of four pregnant women in the experimental group, showing various types of response to the administration of iron: (a) continued fall in spite of iron, (b) a break in the fall but no real rise, (c) and (d) rises

removal of iron as they had given to its administration. The fall in hæmoglobin which manifested itself after the medication with iron had been stopped was not arrested in most cases until delivery. Fig 3 shows the averaged results for both the control and the experimental groups In preparing the averaged curve for the experimental group a difficulty arose in that the women started taking the iron at different stages of pregnancy. Thus it was necessary in constructing the dotted portion of the curve to average "weeks before delivery" as well as hæmoglobin values. The average time at which the first hæmoglobin estimation was made was twenty-four weeks before delivery, and the average hæmoglobin level at this stage was 93 per cent Similarly medication with iron was started, on average, at twenty weeks before delivery and finished at fourteen weeks The mean hæmoglobin levels at these times were 87·4 per cent. and 89 1 per cent. respectively. The important features of fig. 3 seems to be (1) the steady fall of hæmoglobin in the control group and the sharp rise after delivery; (2) the break in the fall caused by the administration of iron to the experimental group; (3) the steady fall on discontinuing its administration, so that the curve runs parallel with that of the control group; and (4) the sharp rise after delivery. The total fall in hæmoglobin level in both the experimental and the control groups is statistically significant. The difference between the levels for the two groups is not statistically significant at any one particular stage of pregnancy, but the fact that after stopping iron the curves run parallel to one another suggests that at this time the average hæmogoblin level of the experimental group really did exceed that of the controls

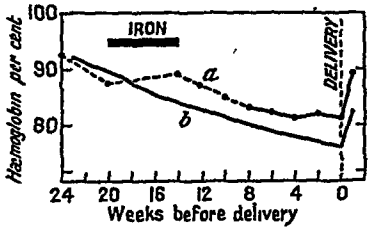

FIG 3—Average hæmoglobin curves for (*a*) experimental and (*b*) control groups of pregnant women. For meaning of interrupted line see text.

DISCUSSION

The administration of iron has been shown by others to check the fall of hæmoglobin during pregnancy (Corrigan and Strauss 1936, Toland 1936) There is therefore nothing original in this The fall after stopping the administration of iron is, however, a new observation and one which it is exceedingly difficult to explain. The following facts must be borne in mind. (1) the phenomenon is not peculiar to pregnancy, as was shown in the early part of this paper, (2) the administration of large (therapeutic) doses of iron for six weeks probably leads to the absorption of at least 500 mg. and possibly up to 5000 mg of the metal, which is certainly not excreted within the period of observation—if at all (Brock and Hunter 1937, Fowler and Barer 1937, Widdowson and McCance 1937), and these amounts, moreover, are outside fœtal requirements (Coons et al 1935, Bethell 1936), and (3) after the iron had been stopped, the experimental women's hæmoglobin level fell at the same rate as that of the controls. This requires confirmation, but it suggests that iron only stimulated the production of hæmoglobin while it was ...ually being administered The body, however, ... able to maintain the extra hæmoglobin in the circulation once it had been formed, but it was unable to prevent a fall in the concentration of hæmoglobin in spite of the greatly increased stores of iron. After the administration of iron had been stopped the level of hæmoglobin behaved as though iron had never been administered at all.

The following may serve as a tentative explanation of the observations One of the many factors regulating the level of hæmoglobin in the circulation is the amount of iron in the plasma; the more there is, the more active the marrow cells become When iron is not being administered, the amount of iron in the plasma is maintained at a low constant level by the high capacity of the storage organs. The administration of iron, however, temporarily raises the plasma iron, which stimulates the marrow to greater activity. It will be noted that this theory emphasises the amount of iron in the plasma rather than the amount in the body as the regulator of marrow activity. There is a totally different explanation, which seems improbable but is capable of direct verification—namely, that the administration of iron causes a decrease in the volume of circulating plasma.

The effects of stopping the administration of iron to women and children who have not been *proved* to be in a pathological state require rather serious consideration. The problem is as follows: does the raising of a person's hæmoglobin with massive doses of iron prove that the person was in need of iron—i.e., in a pathological state? It might very reasonably be held that, if the hæmoglobin fell to its original level when the iron was discontinued, no pathological state had been disclosed Against this view must be set the weight of clinical opinion, which has pronounced definitely in favour of raising the hæmoglobins of babies and pregnant women. No-one has dared as yet to make any definite pronouncement about "normal" women.

If it is impossible to achieve normal hæmoglobins in babies and pregnant women by physiological means —i e, without giving them therapeutic doses of iron—and if perfect health requires a normal hæmoglobin, clearly it is advisable to interfere with physiological processes in the best interests of the subject This obviously raises very fundamental questions about the sanctity of the normal which it would be out of place to discuss here

SUMMARY

(1) The administration of iron in therapeutic doses to pregnant women converted the fall in hæmoglobin, which was then in progress, into a rise.

(2) After the administration of iron had been discontinued, the hæmoglobin fell once more and at about the same rate as if iron had not been administered

Dr. R. A. McCance has been a very great help to me in the preparation of this paper. I am indebted to the Medical Research Council for a personal grant.

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PROPHYLACTIC INOCULATION DURING THE INCUBATION PERIOD

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FROM time to time the opinion has been expressed that antityphoid inoculation undertaken during the course of a typhoid epidemic is dangerous It has been argued that, in consequence of an alleged negative phase resulting from the inoculation, some persons acquire the disease who would otherwise have only temporarily harboured the bacteria and so escaped infection, and others develop the disease in a more virulent form who would have experienced a milder attack No valid evidence in support of such argument is available Indeed the only adequately controlled observations, those of Ramsey (1935), demonstrated not only that typhoid infection in inoculated contacts was not provoked, but also that, certainly after the completed set of three doses and probably after even one or two, the incidence rate for the disease was lowered

In view of the lack of experimental work bearing on this question and in view of remarks on this subject in the medical press (*Lancet* 1937, *British Medical Journal* 1937 Ledingham 1937, Topley 1938) after the Croydon typhoid epidemic of 1937 it was decided to examine the effect on the death rate of inoculations given after infection, during what may be regarded as the incubation period

DETAILS OF EXPERIMENTS

The animal chosen was the mouse and the infecting organism *S typhi murium* A mortality of 50 per cent during an observation period of three weeks was aimed at among the controls, so that any effect the inoculations might have on the course of the disease would be indicated by either an increase or a decrease in the death rate In the ordinary white mouse as purchased by the Lister Institute, an infecting dose of between one and two thousand organisms of a 24 hour broth culture of the typhi murium strain employed, given subcutaneously between the shoulders achieved the desired result and was given to these animals consistently throughout the experiments The typhi murium vaccine was administered in four daily doses, subcutaneously in alternate flanks This system of multiple dosage was adopted with the idea of lowering the size of each individual inoculation Since the first deaths among the infected mice take place about the seventh or eighth day, inoculation was begun forty eight hours after infection, when the bacterium had well established itself, but there was still time to complete the vaccination before the animals began to die As a guide to what amount of vaccine could be tolerated and be effective, in the first experiment three groups of mice were given total doses of 1 5 million, 15 million, and 150 million of a heat killed vaccine, which, the body weights of man and mouse being compared, represented approximately 1, 10, and 100 equivalents of the amount of T A B vaccine administered prophylactically to a human being

The vaccine, it should be noted, was killed by heating to 53° C for 70 min and phenolised to 0 5 per cent after cooling On the following day 1 c cm was tested for sterility and after three days, being seen to be sterile, used in the experiment This was the only occasion on which a heat-killed vaccine so recently prepared was employed

The results of this experiment (table I) show clearly that, whereas the smallest vaccine dose is without effect, the two larger doses definitely are damaging to the animals, almost double the number of mice dying in each of these groups There was, however, one qualifying thought to be taken into consideration The vaccine given had produced local reactions in over half of the animals receiving the highest dose, some showed these subcutaneous infiltrations the day following the second dose of 20×10^8 organisms and others after the third dose of 40×10^8, no examination having been made after the last inoculation Since much larger doses of typhi murium vaccine had often been given in other experiments to mice without such reactions being noticed, it seemed possible that this particular batch of vaccine might somehow be responsible for the reactions An unusual feature of the batch was its recent manufacture only four days having elapsed since it had been heated and phenolised Its sterility had been proved by subculture of 1 c cm The possibility of an unusual toxicity, perhaps associated with its recent preparation remained

A second experiment was therefore planned in which a more mature vaccine was used it had been killed with chloroform at 37° C for 15 min six weeks previously Two groups of mice were given 0 10^8

TABLE I—FRESHLY KILLED VACCINE

Vaccine administered in 4 doses	Mice	After 21 days		A L E
		Dead	Percentage survivors	
1 5 × 10^8 organisms heat killed	24	10	58	14
15 × 10^8 organisms heat killed	24	17	29	11
150 × 10^8 organisms heat killed	24	17	29	15
Controls	24	9	62	17

A L E = Average length of life in days of those dying during the period of observation

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and 600 × 10^6 organisms each in four doses as on the first occasion, but a further two groups were added which were given the same doses a fortnight before the infecting dose to establish contrastingly the ordinary prophylactic value of such doses. Special attention was paid to the development of subcutaneous reactions after vaccination; but, although the doses in the groups receiving the larger amount

TABLE II—VACCINE KILLED SIX WEEKS PREVIOUSLY

Vaccine administered in 4 doses	Mice	After 21 days: Dead	After 21 days: Percentage survivors	A.L.F.
6×10^6 organisms chloroform-killed before infection	24	5	79	17
600×10^6 organisms chloroform-killed before infection	24	1	96	19
6×10^6 organisms chloroform-killed in incubation period	24	5	79	15
600×10^6 organisms chloroform-killed in incubation period	24	13	43	15
Controls	24	12	50	14

varied from 40 × 10^6 on the first inoculation to 320 × 10^6 on the fourth, no sign of such inflammatory infiltrations as had been observed with the first vaccine was now noticed either in the mice inoculated prophylactically or in those receiving vaccine during the incubation period. One might infer from this that the unusual toxicity exhibited by the first heat-killed vaccine was not present in this second chloroform-killed vaccine. Table II summarises the results.

In this second experiment no detrimental effect of vaccination during the incubation period is to be noted. Even among the mice given the large amount of 600 million organisms, which represents, body-weight for body-weight, the equivalent of 400 human T.A.B. doses, no significant increase in mortality is observable, and the same dose prophylactically administered protected all but one for the period under observation, which indicates that the protective effect of the larger dose is not fully developed in the short time available when it is given during the incubation period, or that its immunising power is partly annulled by some detrimental effect. On the other hand, the smaller dose of 6 million organisms has more than halved the numbers dying among the controls. The same effect was produced by that dose given prophylactically.

In a suitable dose vaccination in the incubation period has protected and in no wise proved detrimental to the inoculated animals. It seemed increasingly likely that the poor results achieved in the first experiment were due to an unusual toxicity in the vaccine employed.

A further set of experiments was now devised to compare other vaccines killed in various fashions. (1) heat-killed and (2) chloroform-killed, as on the previous occasions; (3) heated at 60° C for two hours without subsequent phenolisation, and (4) chloroform-killed but given fresh on the day of manufacture. An exact repetition of the first 53°-killed vaccine was not attempted, for the exact day on which those organisms which survive this heating succumb to the phenol is not predictable, and the intention was to give as freshly prepared a vaccine as possible. In all other cases the vaccines were at least a month old.

In one experiment an antityphoid vaccine was included to consider its possible non-specific effect. Another experiment tested the influence of an enteritidis vaccine on the course of an enteritidis infection. Protection was not expected in this case, because, in my experience, with no vaccine, short of a living avirulent one, can mice be adequately immunised against infection with *S. enteritidis*, but, should vaccination in the incubation period exacerbate infection, this would be observable in an acceleration of the death-rate. The infective dose in this case consisted of 6000 organisms of a 24-hour 37° broth culture injected subcutaneously between the shoulders, four daily inoculations were given subcutaneously in alternate flanks, the first being given forty-eight hours after infection. In one typhi-murium experiment the custom of vaccinating with four daily doses was varied and the same amount of vaccine administered in two inoculations on the second and third days after infection. If possible, from an immunological point of view, this method of administration would obviously be preferable. The results of these experiments are given in tables III and IV.

From table IV one learns that enteritidis vaccine given as in the previous typhi-murium experiments has no influence on the course of the infection; in each group there are but 2 or 3 survivors after twenty-one days, and the average length of life is the same. There is no evidence of any provocative action.

Table III demonstrates once again—this time with three different preparations—that typhi-murium vaccine administered during the incubation period does not exacerbate the infection but on the contrary significantly lowers the mortality of the treated mice, that inoculation of the vaccine in two, instead of four, doses is an effective mode of administration; that non-specific treatment, as afforded by an antityphoid vaccine, does not influence the course of the disease;

TABLE III—VACCINES KILLED BY DIFFERENT METHODS

Vaccine administered	Mice	After 21 days: Dead	After 21 days: Percentage survivors	A.L.F.
6 × 10^6 organisms chloroform-killed, in 4 doses	24	6	75	12
6 × 10^6 organisms 60° C killed, in 4 doses	24	7	71	13
6 × 10^6 organisms 53° C killed, phenolised, in 4 doses	23	7	70	14
Controls	24	13	46	13
6 × 10^6 organisms 53° C killed, phenolised, in 2 doses	23	3	87	11
6 × 10^6 organisms chloroform-killed, fresh daily, in 4 doses	24	5	79	8
6 × 10^6 organisms, antityphoid vaccine, in 4 doses	24	7	71	13
Controls	23	7	69	13

TABLE IV—ENTERITIDIS VACCINE

Vaccine administered in 4 doses	Mice	After 21 days: Dead	After 21 days: Percentage survivors	A.L.F.
6 × 10^6 organisms, 53° C killed, phenolised	22	19	14	11
Controls	24	22	9	11

and that freshly prepared chloroform-killed vaccine is not damaging as was the freshly prepared heat-killed vaccine of the first experiment. There were no skin reactions as with the vaccine in the first experiment, but the dosage was considerably lower than that which produced them on the first occasion.

Since treatment with two doses in place of four appeared efficient this method was employed in the next experiment, which was undertaken to ascertain whether the rather arbitrarily chosen dose of 6 × 10^6 organisms was optimal. Batches inoculated with a

quarter of and with four times this amount were included The results are recorded in table V

TABLE V—EFFECTS OF VARIOUS DOSES IN A DIFFERENT STRAIN OF WHITE MICE

Vaccine administered in 2 doses	Mice	After 21 days		A L F
		Dead	Percentage survivors	
1·5 × 10⁸ organisms, 53° C killed phenolised	24	15	37	12
6 × 10⁸ organisms, 53° C killed phenolised	24	13	46	11
24 × 10⁸ organisms, 53° C killed phenolised	24	13	46	13
Controls	24	11	54	13

In this experiment, in contradistinction to those recorded in tables II and III, vaccination of mice in the incubation period has not increased their resistance, indeed, in one group, that receiving the smallest dose, a definite increase in mortality can be observed Since the mice employed on this occasion had been purchased from a different dealer and there was just a possibility of their possessing a diminished immunisability, animals from the original source were used with two batches of typhi murium vaccine in an attempt to repeat the results of the earlier experiments (table VI)

TABLE VI—EFFECTS OF VARIOUS DOSES IN THE ORIGINAL STRAIN OF WHITE MICE

Vaccine administered in 2 doses	Mice	After 21 days		A L F
		Dead	Percentage survivors	
6 × 10⁸ organisms, 53° C killed, phenolised	25	7	72	14
6 × 10⁸ organisms, 53° C killed, phenolised	23	5	78	12
Controls	26	6	77	13

The experiment recorded in table VI brings no evidence for provocation of the disease by inoculation, but there is also no evidence of immunisation It was noticeable, too, that the strain of *S typhi murium*

TABLE VII—RESULTS OBTAINED IN BLACK MICE

Vaccine administered to pure line E mice in 2 doses	Infecting dose	Mice	Dead after 21 days	A L F
6 × 10⁸ organisms 53 C killed phenolised	1600 org	14	14	9
Controls	1600 org	13	13	9
6 × 10⁸ organisms 53 C killed, phenolised	193 org	15	15	12
Controls	193 org	15	15	13

TABLE VIII—PURE LINE 1 MICE INFECTED WITH 150 ORGANISMS AND GIVEN 6 × 10⁸ ORGANISMS OF 53° C KILLED VACCINE

Vaccine administered	Mice	Deaths occurring on days after infection																Dead	A L F
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21		
In 2 doses	40	0	1	0	4	6	6	4	0	3	1	2	0	0	1	0	1	40	13 1
In 4 doses	39	0	0	2	1	5	8	4	5	6	2	3	0	1	0	0	0	39	14 0
Controls	40	1	0	3	3	4	5	11	4	2	0	0	1	0	0	0	0	40	12 2

was just a possibility of their possessing a diminished immunisability, animals from the original source were used with two batches of typhi murium vaccine in an attempt to repeat the results of the earlier experiments (table VI)

The experiment recorded in table VI brings no evidence for provocation of the disease by inoculation, but there is also no evidence of immunisation It was noticeable, too, that the strain of *S typhi murium* was diminishing in virulence only 23 per cent of the controls now dying after the usual infective dose of between one and two thousand organisms

To study the effect of race on animal response and to work with a mouse strain more susceptible to infection with *S typhi murium*, the mice used in the next experiments were Little's C 57 blacks, a pure line labelled E in this laboratory and known from previous work (Schütze et al 1936) to be less resistant to salmonella infection So little resistance to *S typhi murium* have these mice that a mortality of 100 per cent is to be expected within three weeks, and a comparison of treated and untreated animals can rest only upon the rate at which they die In the first of these experiments the usual infective dose of between one and two thousand organisms was given, in the later ones 193 and 150 organisms were the amounts given, so that a more prolonged incubation period might ensue In the last experiment the effect of two doses of vaccine was compared with that of four doses, in all cases administration was begun as usual forty eight hours after infection The first two experiments are given in table VII, and the last in table VIII, where the daily death rate is recorded in addition

The results of these three experiments on pure-line mice confirm those already obtained on the ordinary white mouse Vaccination in the incubation period has no damaging effect The death rate is not more rapid among the inoculated than among the controls There is no suggestion that, whereas some favourably disposed individuals among the vaccinated have benefited from the treatment, as shown by a delayed death rate others less favourably disposed have fallen victims to the measure and succumbed more rapidly Mortality among the three groups proceeds at very similar rates

DISCUSSION OF RESULTS

An attempt to demonstrate whether prophylactic inoculation during the incubation period is harmful was carried out on mice with *S typhi murium* as the infecting agent and variously prepared vaccines prepared from the same strain for inoculation By comparing the death rate of treated and untreated animals it was hoped to estimate whether vaccination was damaging or not

In one experiment damage resulted from the treatment, and in this case the vaccine appeared to be at fault A four-day old specimen had been used and was found to give unusual local reactions an indication that the vaccine was abnormal The cause of this abnormality was not detected, whether in spite of the satisfactory sterility test the vaccine still contained living organisms, or whether because of its recent manufacture or for some other cause it was unusually toxic, remained undecided

In twelve other experiments, in which vaccine dosage varied from 1·5 × 10⁸ to 600 × 10⁸, only one gave a death rate notably below that of the control, 15 treated mice died within the three weeks of experiment as compared with 11 of the controls, there being 24 in each group, the dosage on this occasion consisted of the lowest tested, 1·5 × 10⁸ organisms Obviously such a result obtained from that number of animals is not significant A more reliable answer will be that given where a summary of results is taken

In the course of the various experiments on white mice 216 mice were treated with a vaccine dosage of 6 × 10⁸ organisms and had a survival rate of 72 per cent at the end of twenty one days, on the other hand only 59 per cent of the 120 untreated controls remained alive after the same period, a clear indication that not only does vaccination in the incubation period not do harm to mice infected with *S typhi murium* but also that it can noticeably afford them protection This dosage as given to the mouse

represented, body-weight for body-weight, the equivalent roughly of four times the amount of T.A.B. vaccine given to an adult human being. That the animals are not more definitely protected may well be due to the short time available for the process of immunisation. Vaccination took place on the second and third, sometimes as well on the fourth and fifth days after infection; the first death among the controls took place variously between the sixth and ninth days.

Similar tests were carried out with a pure line of mice particularly non-resistant to infection with *S. typhi-murium* and with the ordinary white mouse infected with *S. enteritidis* and treated with a corresponding vaccine. In both these cases, mortality being 100 per cent., comparison had to be made of the rate at which the animals died. The average length of life was in no way shortened by the process of inoculation. Vaccination during the incubation period was not damaging to the animals.

The conclusion, therefore, to be drawn from these experiments is that it should not be considered dangerous to inoculate a community during the course of a typhoid epidemic. If the source of infection is still undetected and possibly active, there would undoubtedly be time for prophylactic immunisation to intervene with beneficial effect. In those cases already infected with the bacterium no harm need be anticipated, and with the greater length of the incubation period in man more hope of prophylaxis may be entertained.

SUMMARY

(1) Mice were infected with *S. typhi-murium*, and two days later inoculation with a specific vaccine was begun.

(2) Such vaccination during the incubation period did not exacerbate the course of the disease.

(3) White mice (216) treated in this way showed a mortality of 28 per cent. at the end of three weeks, whereas untreated controls (120) had a mortality of 41 per cent.

(4) The average length of life of Little's C 57 black mice, a pure-line mouse particularly sensitive to infection with *S. typhi-murium*, was not decreased by vaccination in the incubation period.

(5) Vaccination with enteritidis vaccine after infection with *S. enteritidis* similarly did not accelerate the onset of the disease.

(6) The opinion is expressed that vaccination of a community during the course of a typhoid epidemic is by analogy to be recommended.

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CLINICAL NOTES

CLOSTRIDIUM WELCHII SEPTICÆMIA AND PERITONITIS IN THE PUERPERIUM

RECOVERY AFTER M. & B. 693 AND SERUM

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Bliss and his collaborators (1939) have reported encouraging results of M. & B. 693 therapy in experimental *Clostridium welchii* infections in mice, but I have found no account of the employment of this drug in a severe human infection. Bohlman (1937) records success with sulphanilamide in surgical conditions and Sadusk and Manahan (1939) in two post-abortal septicæmias. In the following case the infection was unusually severe.

A woman aged 24, in her second pregnancy, was admitted to the Middlesex Hospital, London, on May 3 for medical induction of labour. It had been discovered by radiography that the uterus contained two fœtuses of about thirty weeks' gestation, and that the skull bones of one were overlapping; the other fœtus appeared radiologically to be anencephalic. At the end of her induction she expelled the first fœtus, which was anencephalic. At this point labour pains ceased, and it was thought advisable to await their return before attempting to deliver the second fœtus. Pitocin (3 units) was injected hourly, but after twelve hours pains had not returned. Examination then revealed the cervix about two fingers' dilated. Under anæsthesia it was dilated digitally, and the trunk and limbs of the grossly macerated second fœtus were delivered. The second head, however, remained in utero, and could only be delivered after perforation of the skull, and traction with the finger in the mouth. The placenta was expelled naturally.

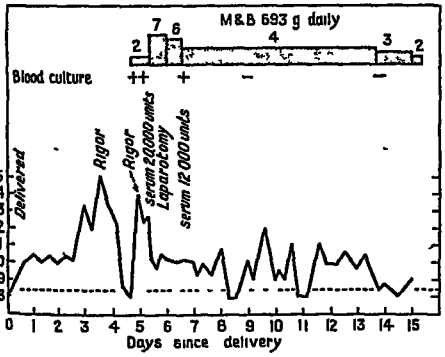
At the end of labour the temperature was 100·4° F., and twelve hours later, though the temperature was only 100° F., the lochia were noticed to be offensive, and she was transferred to Queen Charlotte's Hospital isolation block. She was then in good general condition. Forty-eight hours later she complained of lower abdominal pain, and began to pass greenish sloughs per vaginam. Later the same day she had a rigor and the temperature rose to 105° F. Glycerin was injected into the uterus and examination at this time showed induration of the parametrium on both sides. A second rigor occurred twenty-four hours after the first, and blood taken at this time yielded *Cl. welchii* on culture. Next morning—i.e., the sixth day after delivery—she developed signs of general peritonitis, with much distension. Concentrated anti-gas-gangrene serum (20,000 units) was given intravenously diluted with saline, and during the course of the day M. & B. 693 7 grammes by mouth. The abdomen was opened by Mr. L. C. Rivett in the evening under gas-and-oxygen anæsthesia, by which time her condition had become desperate.

On opening the peritoneal cavity there was an almost explosive escape of gas, and about 10 *oz.* of bloodstained serous effusion was found in the general cavity, the pouch of Douglas containing thick pus. Cultures from fluid taken at the time of laparotomy grew *Cl. welchii* and anaerobic streptococci, not only from the general peritoneal cavity but also from the thick pus. No attempt at hysterectomy or thorough exploration of the abdomen was made, the surgical measures being limited to drainage, through the incision, of the pouch of Douglas and the general peritoneal cavity.

At the end of the operation and for the next six hours the patient appeared to be moribund, with a bluish colour, shallow rapid respiration, and an uncountable pulse; but at the end of that time she recovered sufficiently to take more M. & B. 693 by mouth. For two days after this her condition appeared most precarious, and as she seemed profoundly toxic another 12,000 units of serum was given by the same technique on the second postoperative day. It seems probable however that the toxic appearance was due more to the M. & B. 693 than to the infection, although at this time the blood-culture was still positive for *Cl. welchii*. For a week after the opera-

tion the lochia consisted of greenish pus and sloughs of uterine muscle

The subsequent progress may be estimated from the accompanying chart The total of M & B 693 was 44 g in nine days Convalescence was interrupted by a severe urinary infection with *Streptococcus fæcalis*, and the formation of an inflammatory mass in the pelvis late in convalescence, both of which responded well to medical treatment At the time of her discharge, fifty-four days after admission, the uterus was surprisingly mobile and of normal size



Temperature and treatment chart
+ = positive blood-culture
− = negative blood culture

Wrigley (1930) postulates certain conditions attending labour likely to be followed by gas forming infections—viz, (*a*) the fœtus is dead for some hours in utero, (*b*) the organism must be introduced from outside the birth canal by manipulations, and (*c*) the manipulations must to some extent damage the maternal tissues in order to afford a portal of entry for the organism All these conditions were fulfilled in the case described

This puerperal case did not present any of the signs of hæmolysis so often noted in postabortal *Cl welchii* septicæmias, such as hæmoglobinuria and pigmentation of skin (Hill 1936)

During the twelve hours preceding operation and in the course of the next nine days this patient received 44 g of M & B 693 by mouth It would be unwarrantable to attribute any specific action to the drug on the evidence of this case alone, especially as specific serum was administered at the same time, but the ultimate recovery from so grave an infection is very encouraging, and in view of the accumulating experimental evidence (Bliss et al 1939, Sadusk and Manahan 1939, Buttle 1939) it seems that further trial of the drug in *Cl welchii* infections is justified

The total dose of serum in this case was only 32,000 units In two non fatal postpartum septicæmias reported by Hill (1936) and three postabortal cases reported by Buchanan (1932) the average dose was 243,600 units Many patients have received much larger quantities and failed to survive

I am indebted to Mr L C Rivett and the honorary staff of Queen Charlotte's Hospital for permission to report this case, and to Dr E D Hoare for the bacteriological reports and to Mr O Lloyd and Dr T G Williams of the Middlesex Hospital for the obstetric story I should like to express my gratitude to Dr Leonard Colebrook for his invaluable help in the preparation of this report

References at foot of next column

FATAL AGRANULOCYTOSIS FOLLOWING TREATMENT WITH M. & B. 693

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AGRANULOCYTOSIS is a well known complication of sulphanilamide therapy, but only 5 cases have hitherto been reported following the use of M & B 693 (Barnett et al 1939, Coxon and Forbes 1938, Johnston 1938, Sutherland 1939, Tzanck et al 1939) In none of these was an autopsy described

Our patient, aged 60, a hawker by trade, was admitted to St Stephen's Hospital on May 1, 1939, with gonococcal urethral discharge for a week and a right-sided epididymo-orchitis Apart from this (and pediculosis) he was healthy The blood gonococcal complement-fixation test was positive, the blood Wassermann reaction negative and the blood Kahn "suspicious"

Two days after admission M & B 693 therapy was started, he was given 4 g a day for five days, then 3 g a day for a further sixteen days making 68 g in twenty one days He was also given potassium citrate 20 grains t d s, fomentations to the scrotum till the fourteenth day, and Iodex applications till the twenty-first day

After seven days of treatment there was no urethral discharge, the epididymitis was subsiding, and the patient appeared in good general health All treatment was stopped on the twenty-first day, the temperature, pulse- and respiration rate having been normal throughout But six days later—i e, twenty-seven days after beginning treatment—the patient felt unwell He complained only of malaise and frontal headache, he did not complain of his throat In the morning his temperature rose to 103° F There were no abnormal signs save a slight redness and "fleshiness" of the fauces That evening the temperature was 105° Hæmolytic streptococci were grown from a throat-swab taken at this stage

Next morning the patient was very ill and drowsy The face was flushed, the tongue was dry with a central brown coat, and there was white exudate on the right tonsil The total white cell count was 300 cells per c mm, all cells seen being lymphocytes Hæmoglobin, 72 per cent, red cells, 4,360,000, colour-index, 0 83, punctate basophilia present Urine porphyrins, not detected, urobilin, present ++, urocythrin, present + He was given Pentnucleotide 10 c cm four times and Hepastab 1 c cm twice, on the day agranulocytosis was diagnosed In the evening his condition was worse and the right tonsil was brown and becoming gangrenous He died the next morning, forty-eight hours after the onset of symptoms, and eight days after the M & B 693 had been stopped

Post-mortem findings—Sloughing of fauces and pharynx Right sided epididymitis Toxic softening of heart muscle Lungs deeply congested, but otherwise normal Toxic changes in liver and kidneys

Histology—Lymph-gland post-mortem degeneration, no leucocytes seen, anthracosis Spleen post-mortem degeneration, no leucocytes seen. Bone-

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marrow (sternum): no leucopoiesis; mild active erythropoiesis.

There are several peculiar features in this case Firstly, there was a clear interval of six days' good health between the cessation of treatment and the onset of symptoms of agranulocytosis. Barnett et al (1939) described a fatal case of appendix abscess from which pneumococci were cultured, in which the white count did not fall till three days after cessation of M & B. 693 administration, though this patient, unlike ours, had not yet been cured of the original condition Death in Barnett's case was due to hæmorrhage from neck abscesses, and cannot be said to have been directly due to agranulocytosis In the other 4 recorded cases agranulocytosis appeared during, not after, the administration

Secondly, hæmolytic streptococci were grown from a throat-swab Did these bear any causal relationship to the agranulocytosis? Clinically the appearance of the throat was that of the gangrenous pharyngitis of agranulocytosis. In the 5 previous case-reports throat-swabs are not mentioned

Thirdly, there was gross reduction of the lymphocytes (300 per c mm.) and complete disappearance of the granular cells This indicates a depression of all the leucopoietic tissues, and the microscopical appearances of spleen, lymph-gland and bone-marrow correspond The patient died before a platelet-count was performed but, as far as could be determined from the ordinary stained film, their numbers were approximately normal The state of the leucopoietic tissues was not reported on in the 5 cases already referred to. In those of Coxon and Forbes and Barnett et al there was gross reduction of all types of white cells, the total counts being 100 and 75 respectively In Johnston's, Tzanck's and Sutherland's cases, however, the lymphocyte count was within normal limits, the figures being 2200, 1000 and 1500 respectively, with polymorphs at zero

Our patient received 68 g. of M & B 693 in twenty-one days This is comparable to the dosages in the other cases—namely:

Sutherland	52 g. in eighteen days	Streptococcal puerperal sepsis
Coxon and Forbes	54 g. in seventeen days	Typhoid
Barnett et al	80·9 g. in twenty-six days	Appendix abscess
Johnston	54 g. in eleven days	Streptococcal endocarditis
Tzanck et al	18 g. in fifteen days	Lobar pneumonia

We wish to thank Sir Frederick Menzies, medical officer of health for the county of London, and Dr. D. S Sandiland, medical superintendent of St. Stephen's Hospital, for permission to publish the clinical details of this case; Mr. Neville Stafford, H M coroner for West London, and Dr. Keith Simpson for permission to publish the post-mortem report, and Dr. G. W. Goodhart, pathologist to the L.C.C. Group Laboratory, for preparing and reporting on the sections.

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MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SECTION OF OBSTETRICS AND GYNÆCOLOGY

THIS section, under the presidency of Prof. R. W. JOHNSTONE (Edinburgh), discussed

Postpartum Hæmorrhage

Dr. ROBERT M CORBET (Dublin) said that in Dublin the third stage of labour is treated in the most conservative manner possible In about two-thirds of the normal cases the fundus is not touched after delivery until the signs of placental separation are present; in the remaining third the fundus is controlled manually, but no massage is allowed After an operative delivery the fundus is usually controlled. Injection of the umbilical cord with saline is practised when the placenta is retained, and expression without anæsthesia has failed It appears to be successful in about a third of the cases, but should not be relied upon in the presence of hæmorrhage In 28,749 deliveries in three years there were only 147 cases (0·5 per cent.) in which manual removal of the placenta was required

Postpartum hæmorrhage Dr. Corbet divided into three distinct types. (1) placental site hæmorrhage, due to premature separation of the placental margin, (2) true atonic hæmorrhage, where there is no bleeding till after delivery of the placenta, and (3) traumatic hæmorrhage, where the bleeding comes from lacerations in some part of the birth canal The cause of partial separation is usually ill-advised handling of the uterus and premature attempts to express the placenta or else, after prolonged operative delivery, a combination of the effects of the anæsthetic and mechanical interference with the placenta. Morbid adhesion of the placenta is rare The onset of bleeding due to partial separation was seldom sudden and severe. A little bleeding was noticed at the vulva; the fundus was found to be above the level of the umbilicus, the placenta was thought to be separated and attempts at expression were made A quantity of clot was expressed but the placenta was still retained. The bleeding appeared to stop, and further time was given for separation, the whole process might be repeated, perhaps several times One of the traps of postpartum hæmorrhage was that bleeding, without injury, might not produce any alteration in the patient's appearance or pulse until much blood had been lost. Up to a point, the loss was compensated for by vasomotor control, but when the limit of compensation had been passed, the patient's collapse might be sudden and profound.

Treatment was complicated by the retention of the placenta Before starting active measures for its removal, the patient's general condition had to be considered carefully. If necessary, efforts should be directed to restoring her by means of intravenous or submammary saline, transfusion, warmth, morphia, raising the foot of the bed, and perhaps bandaging the limbs. No attempt should be made to remove the placenta until the patient's general condition had improved. Manual removal in collapsed patients was a very dangerous operation It was essential to have a complete plan of action in one's mind and to be able to go from step to step, with speed and confidence Dr Corbett advised the following. (1) pass a catheter, (2) rub up the uterus and attempt to express the placenta by the Dublin method, (3) attempt to express it by Credé's method. (4) give an anæsthetic and repeat Credé's method, (5) remove the placenta manually, stop the anæsthetic, and give oxytocic drugs, (6) employ bimanual massage,

(7) give a hot intra uterine douche and (8) pack the uterus The best material for packing was iodoform gauze, 6 in wide, and long enough to pack the uterus with one piece The pack should not be allowed to remain in for more than 24 hours and might often be removed after 8 hours unless the hæmorrhage was of traumatic origin

Oxytocic drugs given before the uterus was empty might produce irregular contraction and make the subsequent removal of the placenta more difficult They should therefore not be used until exploration of the uterus has proved the absence of any hour-glass contraction Pituitary extract (10 units) and ergometrine (0 5 mg) might then be given intramuscularly The ergometrine could be repeated if required as it was free from the undesirable side effects sometimes associated with pituitary extract In carrying out the suggested plan of action, speed was essential, and valuable time was often wasted in arriving at a decision to remove the placenta manually and to pack the uterus

In true atonic hæmorrhage the bleeding started a variable time after delivery of the placenta, and there was no bleeding in the third stage itself Although this type of hæmorrhage might occur after perfectly normal labours, it was more common after difficult deliveries with prolonged anæsthesia In treating it, oxytocic drugs should be given at once Many cases required nothing more than this and abdominal massage of the uterus But if the bleeding continued, the treatment was the same as in the first type of hæmorrhage discussed

In traumatic hæmorrhage the bleeding might come from lacerations in any part of the genital tract, the worst being those of the cervix, these might involve the vaginal vault or even the lower uterine segment In most cases, the diagnosis was made when bleeding continued in spite of the uterus being firmly contracted Where the laceration could be exposed in its entirety stitching would control the hæmorrhage, if this was not possible, as when the laceration extended into the vaginal vault or the lower uterine segment, the laceration, the uterus and the vagina should be packed after removal of the placenta

Investigations into the causes of maternal mortality showed that postpartum hæmorrhage was responsible for 7 5 per cent of the deaths in New York, 6 3 per cent in England and Wales, and 3 9 per cent in Scotland If this mortality was to be reduced the following points must be remembered Anæmia must be treated during the antenatal period Interference with the normal uterine action during the third stage must be avoided The danger of attempting delivery through the partially dilated cervix must be realised Failure of the normal mechanism of placental separation must be detected as early as possible Adequate equipment must be prepared to deal with the hæmorrhage rapidly particularly where the patient's history suggests the likelihood of bleeding An ounce of forethought may save pints of blood

Prof JAMES HENDRY (Glasgow) divided cases of postpartum hæmorrhage into three grades according to the blood lost In grade 1 the loss was a little greater than normal In grade 2 compression of the uterus was necessary to control hæmorrhage In grade 3 blood transfusion and drastic measures were needed

First and second pregnancies and pregnancies from the seventh onwards had a greater tendency to fall into grade 1 Parity had no influence in producing grade 3 A long labour completed spontaneously did not predispose to postpartum hæmorrhage On the other hand, where labour did not terminate normally and general anæsthesia was necessary, there was a greater predisposition Gas and air analgesia did not increase the incidence, whereas morphia did Spinal anæsthesia reduced blood loss quite definitely, compared with delivery under general anæsthesia It was of great value to pull the uterus up out of the pelvis and massage it through the abdominal wall rather than push it downwards Blood transfusion had reduced the mortality in postpartum hæmorrhage by 20 per cent In the prevention of postpartum hæmorrhage it was important to conserve the patient's strength during labour with glucose and sedatives In normal cases the uterus should not be touched during the third stage until the placenta had separated

Dr ÆNEAS MACKENZIE (Tain) said that during 33 years of rural general practice, he had conducted 1301 deliveries Of these 32 had suffered from postpartum hæmorrhage He considered the causes were exhaustion of the patient, shock and fall of blood-pressure, resulting in failure of the uterine musculature to retract The exhaustion and shock might be due to prolonged labour, too rapid labour, or over distended uterus The danger of postpartum hæmorrhage after the birth of an unusually large child could in part be avoided by inducing labour if a woman had gone past term He had had no deaths from postpartum hæmorrhage

Prof FARQUHAR MURRAY (Newcastle) suggested that some of the rare and unaccountable hæmorrhages from an apparently normal empty uterus might be due to unusually large arterial trunks close to the placental site He had never seen sepsis after a manual removal followed by an intra uterine antiseptic douche, if this had been done while the patient was in fairly good condition Delay, from a fear of causing sepsis or because the blood-loss was intermittent and slight, was responsible for many bad results He was against packing the uterus, many cases at present treated by blood transfusion would, he thought, do equally well on gum or glucose saline

Dame LOUISE MCILROY (London) thought manual removal was very dangerous because of the high sepsis rate afterwards She did not think that morphine predisposed to postpartum hæmorrhage She advised the injection of hot glycerin into the uterus as a hæmostatic Miss BEATRICE TURNER (London) also spoke in support of hot glycerin as a useful hæmostatic

Sir BECKWITH WHITEHOUSE (Birmingham) paid a tribute to the care with which obstetrics was conducted in Scotland This was shown in the lower mortality figures for postpartum hæmorrhage as compared with England He advised injection of pituitary extract during the third stage should hæmorrhage occur from a partially separated placenta He was against manual removal in the absence of postpartum hæmorrhage or in cases in which the hæmorrhage could be controlled effectively by other means

Prof DUGALD BAIRD (Aberdeen) said that the use of spinal anæsthesia for forceps delivery greatly reduced the incidence of postpartum hæmorrhage He deplored the use of intra uterine douches and stressed the importance of treating secondary anæmia during pregnancy as a means of preventing serious postpartum hæmorrhage The incidence of manual removal of the placenta in 1000 deliveries in the Aberdeen Maternity Hospital during 1938 was 0 6 per cent

Prof J B DAWSON (Dunedin) did not approve of the routine use of oxytocic drugs after normal delivery He agreed with Professor Hendry that morphine

predisposed to postpartum hæmorrhage He did not fear manual removal as much as some of the other speakers

Sir EWEN MACLEAN (Cardiff) liked gas-and-air analgesia in midwifery and did not think it predisposed to postpartum hæmorrhage He was in favour of midwives being allowed to give this analgesia.

Dr H. R FREDFRICK (Port Talbot) said it was consoling to find that the general practitioner was not always to blame for the bad results which were at times attributed to him.

Professor JOHNSTONE (Edinburgh) commented on the divergence of opinions expressed He did not think one could do harm by placing the hand gently on the fundus before the placenta was delivered.

Dr CORBET, in reply, said he sympathised with the general practitioner in his obstetric difficulties. He agreed about the importance of treating anæmia in the antenatal clinic He re-emphasised the need for conservatism in the third stage of labour and deprecated unnecessary massaging of the uterus before the delivery of the placenta

SECTION OF PHARMACOLOGY, THERAPEUTICS AND ANÆSTHETICS

AT a meeting of this section Dr J ROSS MACKENZIE (Aberdeen) took the chair after Prof DAVID CAMPBELL, the president, had opened the proceedings.

Anæsthesia in Dental Surgery

Dr. FREDA B. PRATT (Oxford), in a paper dealing with the significance of cyanosis in nitrous-oxide anæsthesia, pointed out that anæsthesia in dental surgery is usually performed upon normal healthy unpremedicated patients In such subjects cyanosis denotes a reduction of oxygenation of the blood below normal. With anæsthetics other than nitrous oxide cyanosis signifies respiratory obstruction. With such a weak anæsthetic as nitrous oxide, it is necessary to utilise anoxia to reinforce the effect, and therefore in many patients, particularly if unpremedicated, cyanosis is unavoidable. Cyanosis is not of itself a sign of danger, nor its absence an assurance of safety It does not occur until 5 g. of the hæmoglobin in the arterial blood is in the reduced form. The average patient has 15 g of hæmoglobin per 100 c.cm. of blood, and will become cyanosed if he inhales a mixture containing approximately 10 per cent. of oxygen, since this is capable of oxygenating only two-thirds of the available hæmoglobin A patient with less than this amount of hæmoglobin would not become cyanosed on the same mixture, but a patient with more would become more markedly cyanosed. Patients can be divided into plethoric, normal and anæmic types, and slides were shown to illustrate the fact that when inhaling a mixture of nitrous oxide with say 10 per cent. oxygen the plethoric patient becomes cyanosed earliest, and that a patient with severe anæmia can never become cyanosed, although he is much more depressed than the plethoric or normal patient. The danger of relying on cyanosis as a guide to the depth of anæsthesia is therefore evident The inevitability of marked cyanosis in the plethoric patient with nitrous oxide alone was discussed. The fact that the automaticity of respiration is the cardinal sign of anæsthesia with nitrous oxide was stressed. Various methods of subduing the anæsthetic-resistant patient were reviewed.

Dr. JOHN GILLIES (Edinburgh) described the use of cyclopropane in dental surgery He had found that the greater potency of this agent over nitrous oxide made it possible to deal easily with the unpremedicated, robust adult. After a face-mask induction of anæsthesia, the patient usually remains unconscious long enough to enable completion of the type of dental work undertaken on the ambulant subject If necessary, anæsthesia is prolonged by nitrous oxide, administered nasally. Recovery is rapid and uneventful In the unpremedicated patient, the secretions are stimulated by cyclopropane but not to an inconvenient degree, and the incidence of vomiting is higher than after nitrous oxide alone All the cases undertaken had proved very successful.

Dr W. S MCCONNELL (London) spoke on the use of Evipan in dental surgery on ambulant patients The evipan is injected when the patient is upright in the dental chair The semi-reclining position is not favoured because saliva gravitates backwards, and irritates the pharyngeal wall initiating a cough. The patient is prevented from slipping by supporting him round the pelvis with a strap A prop should be inserted before anæsthesia is begun, and the dentist should hold up the lower jaw to prevent the prop slipping in case the patient yawns. The whole of the estimated dose is injected rapidly. The nosepiece is then placed in position, and anæsthesia continued with nitrous oxide. The dose of evipan administered varies from 0·25–1·0 g The method is especially useful for the vigorous adult and for patients who dislike induction by inhalation methods The patient can leave the dental surgery from ½ to 1½ hr after the operation Chronic alcoholic patients eliminate the evipan rapidly. Pentothal is not favoured because of the marked respiratory depression following its use

Dr. A. H MACKLIN (Dundee) said that he had long held and taught that cyanosis is not of itself harmful but is an inevitable part of nitrous-oxide anæsthesia in the average patient. He stressed the fact that the anæmic patient can be seriously depressed from nitrous oxide, though failing to show cyanosis In his opinion the basis of all forms of anæsthesia is asphyxia, which in the case of nitrous oxide is due to the exclusion of oxygen from the inhaled gases, and with other anæsthetics, due to the poisoning of the cells by anæsthetic which prevents their using the circulating oxygen. Regarding the general technique of dental anæsthesia, he insisted on the necessity for a tight gauze pack in the pharynx and therefore considered the administration of nitrous oxide by a nasal inhaler to be contra-indicated. He advocated the use of a pharyngeal tube.

Dr. B E. COOK (Doncaster) stated that she used ethylene as a routine for dental work. The resulting anæsthesia, deeper than is possible with nitrous oxide, proved useful in the robust adult. It was particularly useful for children. Recovery was uneventful. She employed ethylene without any mishap in rooms where a naked flame was present.

Dr R J. CLAUSEN (London) stated he had found the operating conditions afforded by ethylene to be excellent for dental surgery, but after being anæsthetised by ethylene experimentally, he was impressed by the prolonged postanæsthetic depression, a factor which lowered his opinion of the usefulness of this agent in the ambulant patient

Dr H. W. FEATHERSTONE (Birmingham) described his personal experience of prolonged postanæsthetic depression following cyclopropane

Dr. A. BARNSLEY (Guildford) described a simple method for facilitating venepuncture.

Dr. R E. MANSFIELD (London) asked if Dr. Pratt considered secondary saturation a justifiable procedure

in dental work in cases where an adjuvant to nitrous oxide alone would ordinarily be necessary She mentioned the suitability of vinesthene for dental work in children

Dr J H T CHALLIS (London) spoke of the difficulties of dental anæsthesia in children, and of the lack of any really ideal method

Dr PRATT, in reply, said she considered the use of ethylene in the presence of a naked flame to be very dangerous In her opinion there were degrees of "secondary saturation' Full saturation was dangerous for patients with failing circulation and in any case was not justified for dental extractions There were resistant patients who could be subdued by a modified saturation—i e , by anæsthetising them deeply with nitrous oxide for a short time and then lightening anæsthesia before extractions were commenced For the very resistant patient she preferred to supplement light nitrous oxide anæsthesia with evipan or ethyl chloride

Anæsthesia in Genito-urinary Surgery

Dr T A B HARRIS (London) said that in genito-urinary work anæsthesia may be required to allow either diagnostic investigation or surgical operation Cystoscopy in women can always be performed without an anæsthetic In men, local, general or spinal anæsthesia can be employed The disadvantage of general anæsthesia is its effect of diminishing urinary secretion, but evipan or avertin followed by nitrous oxide delays the secretion of indigo carmine for 1–2 minutes only At St Peter's Hospital for Stone, low spinal anæsthesia is favoured for this procedure If it is known that the cystoscopy will take only a short time, a satisfactory anæsthetic is Omnopon and scopolamine, followed by evipan Pentothal is believed to produce powerful contractions of the bladder, and is therefore contra indicated For cases where anæsthesia is required for surgical intervention, if the patient's general condition is very poor local anæsthesia should be employed An analysis of 24 deaths in poor-risk cases whose average age was 69, and who were dyspnœic at rest, revealed that the most important single factor increasing any risk is cardiac decompensation In this connexion, a too high spinal anæsthetic is dangerous because the stagnation of the circulation in the area anæsthetised provides an increase in the peripheral resistance and therefore increased strain on the heart For this reason in renal surgery unilateral spinal anæsthesia is preferred to bilateral Either avertin or evipan basal anæsthesia followed by general anæsthesia are satisfactory The avertin should be washed out of the rectum just before general anæsthesia is begun, in order that it should not delay the postoperative recovery During convalescence, massage and re educational breathing exercises are important in preventing postoperative complications

Dr CLAUSEN stated that he uses opoidone scopolamine as premedication for cases proceeding to general anæsthesia He dislikes heavy basal anæsthesia, and does not use avertin Drimyl ether has many advantages for general anæsthesia Ethylene-oxygen is very satisfactory for prostatectomy

Dr MCCONNELL considered the all important factor in this type of surgery to be the avoidance of anoxæmia Evipan followed by gas, oxygen and vinesthene delivered from a drip bottle is very satisfactory for prostatectomy If required ether can be given in addition to the vinesthene

Dr P M OVERTON (Bolton) stated that he had found epidural anæsthesia extremely satisfactory both for genito urinary and general abdominal surgery

Dr H H PINKERTON (Glasgow) favoured the use of cyclopropane in the poor-risk patient on account of its freedom from toxicity

Dr FEATHERSTONE was of opinion that a healthy patient could be subjected to any type of anæsthesia with satisfactory results, but that for the poor-risk patient the question of choice of anæsthetic might be very important

Dr HARRIS, in reply, said he considered the use of epidural anæsthesia to be unjustified It was a method fraught with danger from the risk of injecting a heavy dose of procaine directly into the spinal canal, and had been superseded by intrathecal anæsthesia He thought vinesthene a very suitable anæsthetic for the "chesty" elderly patient Cardiac arrhythmia was a frequent complication of cyclopropane anæsthesia which on this account should not be regarded as non toxic

Advantages and Disadvantages of Intratracheal Anæsthesia

An occasional paper on this subject by Dr ROSALIND P MILNE and Dr ROSS MACKENZIE, both of Aberdeen, was read by the former The advantages of intratracheal anæsthesia and the conditions for which it was particularly suitable were reviewed After operations for the repair of cleft palate she recommends that the tube should be left in situ for 12–24 hours—i e , the period during which acute œdema of the glottis might occur She considers that passage of a tube through the nose by the blind method might, if there was coughing and spasm occurred, cause damage to structures in the region of the larynx In her opinion blind intubation should be reserved only for the rare cases in which use of the laryngoscope is contra-indicated Even for oral surgery, oral intubation is favoured

Dr CHALLIS found blind intubation very satisfactory and safe The possibility of causing damage with a laryngoscope must always be borne in mind

Dr GILLIES pointed out that the tube employed should be large enough to provide an adequate airway If the tube were too small to allow free expansion of the lungs pulmonary complications might result

Dr ROSS MACKENZIE replied that blind intubation should be reserved for the expert The novice is not able to avoid the dangers inherent in this method and can be certain of passing the tube successfully only if a laryngoscope is used

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SECTION OF DISEASES OF CHILDREN

WITH Mr GORDON BRUCE (Aberdeen) in the chair, this section discussed

Genito-urinary Infection in Childhood

Dr WILFRID SHELDON (London) said that the work of Chown, and Wilson and Schloss showed that such infections were often blood born, producing an interstitial suppurative nephritis rather than a pure pyelitis Pyelonephritis was the more correct term and pyelitis seemed to be a misnomer The essential point in diagnosing urinary infection was the finding of pus in the urine What number of pus cells should be regarded as of pathological significance? Cunnings and Alice Dickie had shown that urine from healthy boys usually contained no pus The latter investigated the urine of 900 children free from urinary infection and found that using a high power lens 50 per cent of healthy girls had pus cells up to two per field Ordinary specimens of urine were used

after the vulvæ had been swabbed, a drop being taken from a shaken-up specimen

Pyelonephritis was most common in infancy. Craig reported 61 instances in the neonatal period, while in Graham's series of 435 cases, more than half occurred during the first year. The sex-incidence was important There was a preponderance of female cases but this applied to the period after infancy. During the first two years, boys were affected almost as frequently as girls, while in the new-born there was actually a preponderance of boys over girls The high incidence of urinary infection in infancy had been ascribed to ascending infection through contact between soiled napkins and the vulvæ, but this argument was not valid since at this age there was no sex preponderance in girls. The probable cause was the commonness of gastro-enteritis at this time of life There was often a history of bowel upset immediately before the onset of pyelonephritis The infection was presumably blood-born and rigors at the onset indicated a septicæmic state.

The symptomatology of neonatal infection often differed from that in older children The onset might be vague, with restlessness, vomiting, diarrhœa, pallor, collapse and pyrexia. The diagnosis of dehydration fever of the new-born should only be made after urinary infection had been excluded Dehydration fever was relieved quickly by fluids, but the diuresis thus produced might equally well alleviate a urinary infection. Collapse attacks were alarming. In an infant a few days old, they should always suggest urinary infection Vomiting was important, especially in more chronic cases When an infant vomited repeatedly, passed unhealthy motions and failed to gain weight, urinary infection should always be thought of.

Breast-fed babies were almost exempt from pyelonephritis, and less prone to gastro-enteritis, scurvy and rickets. So vitamin deficiency might be a factor.

TREATMENT

In acute pyelonephritis alkalis were the remedy of choice. They sometimes caused slight diarrhœa in young children, but this was lessened if citrates and bicarbonates were used instead of citrates alone Mandelic acid was an acid preparation and, for an acutely ill child with a high temperature, treatment with alkalis was on general grounds to be preferred. Alkalis would clear up cases only if uncomplicated by urinary-tract deformity On the other hand, mandelic acid and sulphanilamide were likely to sterilise the urine even in the face of such deformity, hence one might be lulled into a false sense of security. If alkalis were used, full urinary investigation need only be carried out if there was no response to treatment It was sometimes difficult to get the urine alkaline and it was essential to give alkalis by night as well as by day

Chronic pyelitis called always for exclusion of congenital deformity. Full investigation should include culture of the urine, intravenous pyelography, cystoscopy and ascending pyelography. The latter was possible from birth in a female infant and in boys after the age of three years. Unilateral infection might be dealt with surgically. Alkalis, hexamine, vaccines and sera were generally without effect in chronic cases. Mandelic acid was effective with *Bacillus coli* and *Streptococcus fæcalis* but was of little use with staphylococci and *Bacillus proteus* A concentration of 0·5–1·0 per cent. must be obtained and the pH of the urine must be at least 5·5 At the age of a year, 3 grammes of mandelic acid every 24 hours should be given An extra acidifying agent was usually necessary, such as ammonium phosphate (15 to 60 grains according to the age of the patient and the methyl-red reaction of the urine) The sulphanilamide group were of definite value in chronic urinary infections They were not effective against *Str. fæcalis* but would give prompt success in *B. coli* infections and would clear up that most resistant organism *B. proteus* Sulphanilamide worked best in a slightly alkaline urine and should therefore be given with a small dose of alkali Even in the face of renal damage, one was able to get a sufficient concentration in the urine The dose of sulphanilamide varied with the age For a baby half a tablet might be given 6 hourly. The dose at one year was half a tablet 4 hourly, while for older children it was one tablet every 4 hours. All the various preparations seemed to be equally effective

SURGICAL TREATMENT

Mr. MATTHEW WHITE (Glasgow) said that organic lesions should, if possible, be dealt with surgically. In young children this was no easy task, and for this reason the high incidence of organic lesions had been overlooked in the past In the literature figures as high as 40 per cent were given. He had studied 125 chronic cases admitted for urinary investigation and 150 medical cases from the wards of Professor Fleming. The difference in age in the two series was striking In the medical series the majority were under the age of two years, while many were under one. There were no cases in the surgical group under one year, the majority being over five. Medical cases were investigated chiefly by intravenous pyelography, but in surgical cases cystoscopy, catheterisation of ureters, and retrograde pyelograms were done

The organic lesions found were hydronephrosis with or without obstruction, congenital deformities and renal calculi In the medical series of 150 children, only two-thirds were subjected to intravenous pyelography, the others recovering so quickly that they were discharged Organic lesions were found in 30 per cent In the surgical series of 125 children, 65 had pyuria Of these 27 or 41 per cent showed organic lesions The high incidence in boys (73 per cent.) was partly because stone was more common in male children In the whole series, 18 cases had renal calculi but pyuria was present in only 8

The commonest organic lesion was hydronephrosis It varied from slight enlargement of one pelvis to gross dilatation of both sides The origin was still obscure but two definite types could be recognised, one due to mechanical obstruction, usually congenital stenosis in some part of the urinary tract, and one without any obvious mechanical block. In the latter type, cystoscopy showed a large and patent ureteric opening. The hydronephrosis might be unilateral or bilateral The origin was as yet obscure but some cases had in addition Hirschsprung's disease There might be a neuromuscular disturbance responsible for both lesions. Satisfactory radiograms of the urinary tract might be obtained simply by running a solution of sodium iodide into the bladder.

DISCUSSION

Dr. H G. OGILVIE (Newcastle-on-Tyne) was absent, so his paper was read by the honorary secretary of the section. In the cases under his care in the Babies' Hospital the majority had urinary infection as the sole lesion, but in over one-third it was part of a general sepsis The onset was often acute with

violent vomiting, pyrexia, convulsions, refusal of food and development of the "gastro enteritis syndrome" In other cases the onset was more insidious, the infant becoming fretful, drowsy and losing weight. In these cases there was a peculiar earthy tint of the skin which often gave a clue to the diagnosis Acute abdominal pain, especially in older children, might lead to the diagnosis of acute appendicitis Further, pus might not be present in the urine during the first few days In treatment he found potassium citrate in infants did not give good results It often caused gastro intestinal upset Sulphanilamide, and especially M & B 693, were much more satisfactory In renal tuberculosis symptoms were often absent and the general health fairly good Tuberculous cystitis was invariably secondary to renal tuberculosis The prognosis should be guarded Even after a successful nephrectomy, blood stream infection might occur with a terminal meningitis

Dr ALAN MONCRIEFF (London) said that among 300 cases of dehydration fever under his care at Queen Charlotte's Hospital, the relief was so rapid when these infants were given fluid that he could not believe that the fever was caused by urinary infection or pyelitis In urinary infection a recurrence might be brought about by insufficient fluid intake, the injudicious use of purgatives and upper respiratory infection Acute *B coli* fever was like typhoid fever and sometimes the spleen was palpable When hourly records of the reaction of the urine were kept there was no correlation between the alkalinity and the fall in temperature

Dr K H TALLERMAN (London) said that it was his practice to give ½–1 oz of fluid before each breast feed during the first few days of life This had reduced the incidence of pyrexia in the neonatal period Dehydration fever was particularly liable to occur in large infants who, because of their size, got insufficient fluid He agreed that dehydration fever was not due to urinary infection

Prof G B FLEMING (Glasgow) stressed the importance of urinary stasis and referred to the high incidence of gastro enteritis in urinary infection He was convinced that in older children the lesion was often simple cystitis which cleared up with alkalis in a very short time

Dr FRANCIS ALLEN (London) said that a sustained temperature in the neonatal period often meant pyuria, and if frequent catheter specimens of urine were examined, it was surprising how often a *B coli* infection would be found In cases with chronic pyuria, repeated attacks might be secondary to an infection elsewhere such as the respiratory tract Dr JOHN CRAIG (Aberdeen) drew attention to the initial septicæmia and to its connexion with acute bowel infections

In reply, Dr SHELDON said he was sorry if he gave the impression that dehydration fever was not a definite clinical entity The point was that one should be careful in making such a diagnosis Fluid would relieve the pyrexia but in an infant with a raised temperature for 3 to 4 days it was unsafe to make a diagnosis of dehydration fever The cause was then usually to be found in the urine

The Physically Subnormal Child

Dr ERIC DOTT (Edinburgh) said his conclusions were based on a group of 70 children seen at the outpatient department of the Royal Edinburgh Hospital of Sick Children who showed a slightly subnormal physical constitution These children became too easily fatigued when facing the wear and tear of ordinary home and school life They presented many and varying symptoms of fatigue, including digestive, circulatory and nervous upsets They were handicapped at school and were repeatedly under treatment for various complaints The recurring symptoms caused much anxiety, both in parents and child. The important point in management was that there should be an endeavour to assess these children's capacity and to adjust their activities so as to avoid fatigue This guidance and control had to extend over several years and periodical adjustment was necessary Enough physical and mental rest was essential, if necessary school hours must be curtailed and hours of activity redistributed, diet must be adjusted to suit the child's digestive capacity and to include adequate fresh foods and vitamin B_1, a cheerful and confident atmosphere around the children must be aimed at Full coöperation of parents and education authorities was essential A regime of this nature had been applied in the 70 children mentioned The follow-up showed that symptoms of fatigue could be greatly lessened and a much happier life for child and parents could be obtained

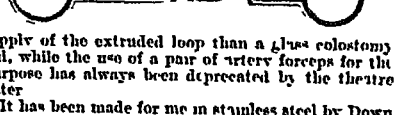
Child-psychiatry and Pædiatrics

Dr ETHEL DUKES (London) put forward a plea for closer understanding between pædiatrics and child-psychiatry The family doctor was often the first to be consulted for behaviour problems and other psychological disorders, and he could consider the patient as a whole and could fully evaluate its environment It was also possible that various organic diseases in children might be but the organic end of functional disorder Psychic conflict or tension might bring about a state of malassimilation and malnutrition in spite of an adequate diet In the so called problem children, nervous complaints and somatic disorders were prominent features, the family doctor and the pædiatrician were more nearly concerned in the first place. The family doctor should be able to diagnose and treat minor psychological disturbances, and often he was the only person who could bring about the necessary environmental changes Just as the general practitioner and the pædiatrician should develop the psychological approach, so the child psychiatrist should have experience of children's medicine and normal children before he commences his special training

New Inventions

COLOSTOMY TRANSFIXION PIN

THE pin and cap here illustrated may be found useful by surgeons who employ this particular technique It is handier and less liable to damage the blood-



supply of the extruded loop than a glass colostomy rod, while the use of a pair of artery forceps for the purpose has always been deprecated by the theatre sister

It has been made for me in stainless steel by Down Bros Ltd, of St Thomas's Street, S E 1

T. B MOFFAT, F R C S

"When a thing is old, broken, and useless we throw it on the dust heap but when it is sufficiently old, sufficiently broken, and sufficiently useless we give money for it, put it into a museum, and read papers over it which people come long distances to hear"—SAMUEL BUTLER in his note-books.

REVIEWS AND NOTICES OF BOOKS

Facts About Food

By S HENNING BELFRAGE, M.D. Lond. London. Humphrey Milford, Oxford University Press 1938. Pp 177. 3s. 6d.

Food, Health, Vitamins

(8th ed.) By R H. A. PLIMMER, D.Sc. Lond., professor of chemistry in the University of London at St. Thomas's Hospital; and VIOLET G PLIMMER London: Longmans, Green and Co. 1938. Pp 233. 5s.

Food, Facts, and Diet Planning

By GRACE MACDONALD, B Sc., F.R.I.P H., head of the science department, College of Domestic Science, Atholl Crescent, Edinburgh. London: Macmillan and Co. 1938. Pp. 168. 3s.

Sun Diet

By T. H. SANDERSON-WELLS, M.D. Lond., F.R C S.E., consulting surgeon, Weymouth and District Hospital. London: John Bale, Sons and Curnow. 1939. Pp. 100. 5s.

WHY do people write books about food? Here are some possible reasons. A publisher has suggested it, a teacher feels he ought to be an author, authorship may be a step towards a post as a teacher Those devoid of self-interest are perhaps suffering from a repressed complex which must express itself—in other words a *cacoethes scribendi* We suggest that no-one should write a book on dietetics unless he has done some research in the subject, unless he knows his subject, both qualitatively and quantitatively, unless he has a sceptical but none the less commonsense type of mind, and finally unless he has outlived the intellectual sloppiness of youth

Only one of these books successfully passes these tests The first author fails to be quantitative "Meat is a good source of vitamin B" he says on p 87 He is inaccurate · "The *carrot* is a good source of vitamin D or its precursor carotene and *also of vitamin A*" (p *101*). And he is very vague The third volume is also non-quantitative and gives no evidence that its author knows her subject "Some of the amino acids of proteins are," she says, "more important than others and they must be *joined up in the proper order*" (p *34*). Chapter VI is headed "The Large Intestine a Laboratory of Disease" The fourth volume is dogma without backing *Biblia abiblia*

Professor and Mrs. Plimmer's book is now in its eighth edition and, like good wine, needs no bush to advertise it. It has obviously met a need. To so well established a friend, criticism must be a compliment. Do the Professor and his wife really intend the implication contained in this sentence on p 3 · "Incidentally cancer and diabetes, two scourges of civilisation, have increased proportionately to the sugar consumption"? And what are we to say of the statement that "*Cow's milk and green vegetables* are the chief sources of calcium" (p 38)? Many fish (see McCance and Shipp and p. 216 of the book itself) are better sources of calcium than most green vegetables except spinach, and in spinach the calcium is unavailable because of the oxalate present. In considering the effect of canning upon vitamin C it would be fair to mention Miss Olliver's work. The footnote on p 72 reads "Levo-rotating polarized light to the left" This does not help the layman and sets the teeth of a physical chemist on edge The relatively large amounts of vitamin B_1 in pig products do not receive mention on p. 94. And on what grounds do the authors say that in boarding-schools there is a prevalence of constipation? Statistics please! In spite of these blemishes (and a certain air of crankiness) the book may be recommended to those who can sift chaff from wheat, or better, bran and germ from endosperm

Genetics and the Clinician

By LINDSAY RIDE, M A, B M. Oxfd, professor of physiology, University of Hong-Kong. Bristol: John Wright and Sons 1938. Pp 116 10s. 6d

RECENT progress in the science of genetics has been made chiefly in the fields of experimental breeding and cytology *As it is impossible to conduct breeding* experiments in man, our knowledge of human genetics has necessarily been gained by indirect methods The familial incidence of certain physical and mental characteristics is observed to correspond generally with the ratios which we have learned to expect from animal and plant experiments How far can the knowledge thus gained be applied to the prevention of human infirmities? Professor Ride gives a complete answer to this question in a well-written and instructive book It is valuable for what it omits no less than for what it includes. The reader is introduced to the principles of mendelism as observed in the pea and to those of chromosome behaviour as illustrated by the fruit fly Then, in chapters which deal with genetical ratios in human pedigrees, anthropological physiology and the inheritance of blood-groups, these data are applied to man There is a final chapter describing *possible methods of advancing the study of human* genetics and the book ends with a useful glossary

Professor Ride has the gift of lucid and forceful writing He succeeds in making both intelligible and interesting such complicated processes as linkage and *crossing* over of genes, independent assortment of genetic character and the confusions which have arisen in the description of human blood-groups If his recommendations as to the teaching of genetics in medical schools were carried out, this volume would well serve the purpose of a textbook for use in the preclinical period

Physiotherapy in Medical Practice

By HUGH MORRIS, M D. Belf, D.M.R E., consulting radiologist to the Devon Royal Hospital, Buxton; radiologist to the Salford Royal Hospital and the Royal Manchester Children's Hospital. London: Edward Arnold and Co. 1939. *Pp. 270. 12s 6d*

Dr Morris says that he writes for the practitioner *who has no specialised knowledge of electrotherapy*, and his exposition is clear enough for the beginner The subject matter is necessarily condensed, but Dr. Morris has included an amazing amount of practical information. The only chapters that suffer from excessive compression are those on diathermy and ultraviolet treatment In the former the value of diathermy in improving the circulation and aiding growth in paralysed limbs deserves to be mentioned. and in the latter the excellent results obtained in surgical tuberculosis are not sufficiently stressed, the contraindications and risks of treatment are merely indicated and the grave danger of submitting cases of active pulmonary tuberculosis to routine treatment are not sufficiently emphasised. The chapter on infrared treatment is an able summary of the present position, in which *current fallacies have been avoided* The book deserves a place on the shelves of every practitioner and of every electrotherapeutic department

THE LANCET

LONDON SATURDAY, SEPTEMBER 16, 1939

SOMETHING BETTER

THOSE who followed the deliberations of the seventh International Genetics Congress, reported in more detail on p 663, felt it had something of a symbolic significance Five hundred and sixty delegates, representing thirty-three countries, had met to debate the contributions of forty fruitful years to the youngest of the biological sciences Five hundred and sixty enthusiasts, no longer iconoclasts, were thinking in terms of pure botany and zoology, the age-old crafts of plant and animal breeding, and, not least, of the scientific betterment of man himself They were men and women animated for a time by an international spirit Their only racial distinction was a specially warm welcome for the contribution of a delegate from a country other than their own In spite of the wishful thinking that has taken the place of observation and deduction in the all-highest medical circles of Germany, the papers of the German delegates were listened to with interest and appreciation The congress had the benefit of their presence for a single day only before they were recalled

Genetics is no longer a novelty, promising sudden revelations or revolutions in scientific thought, it has settled down as a well-established branch of biology with its own laws, principles, and technique A biological science so well established must have a definite contribution to make to medical education and practice The General Medical Council has recommended that special attention should be paid to genetics during the preclinical years, presumably because it helps the student to understand the transmission of hereditary abnormalities, and the part played by inborn predisposition in disease To the average medical student and for that matter to the average doctor, genetics is still an obscure and academic subject, quite unconnected with the wards and the outpatient departments The proceedings of the congress showed clearly, for the first time, that there does exist a science of human and medical genetics, different from the genetics of the textbook and the laboratory Unlike the drosophila or the guinea-pig the human species cannot be artificially mated and it would need a Methuselah to follow out the effects of human mating Instead one has to observe conjunctions apparently made at random The problems presented are quite straightforward but are not set out in the usual textbook form Special mathematical methods are required It is however, fortunate that while the precise methods of computation may be intricate and not as yet fully agreed upon what the mathematician is trying to do is obvious enough It could in fact be explained in the wards far more easily than many a problem in practical bacteriology

Medical genetics is really a part of general medicine, with applications to the other clinical subjects, and not least to preventive medicine The ideal is for the student to receive practical teaching in genetics during his ordinary instruction in the wards and special departments A case of hereditary disease or abnormality might form the text for a discussion which would start with a reminder of the basic principles of the subject, and then apply these principles to the individual patient, the family group, and the population at large Two of the special departments, the ophthalmological and the dermatological, get more than their share of hereditary abnormalities, and they might well serve as reservoirs of teaching material When medical education once more settles down to an ordered routine, it would be a reminder that after war comes peace and rebuilding, if a few clinical lectures on genetics illustrated by patients, could be squeezed in Genetics may seem a luxury in war-time It takes many years to grow a man It is quicker to kill him than to cut down a tree In our preoccupation with destruction, genetics reminds us that the only justification for slaughter is a determination to build something better in its place

CLOSED 'METHOD OF TREATING WAR WOUNDS

SINCE 1918 war surgery has not stood still, but has marched on, as it were, in mufti Although great advances were made in the treatment of wounds and fractures during the last war, perfection was still far distant when it ended The subsequent years of comparative peace have provided an opportunity for consolidating the positions reached and for further developing methods that were being evolved For example, the one devised by WINNETT ORR for the treatment of infected open fractures has been applied to the treatment of osteomyelitis and is now widely used with various modifications On a smaller scale the possibilities of what is known as maggot therapy have been explored, as is recalled by a letter in our correspondence columns this week Recently too, the war in Spain has given surgeons the opportunity for testing new methods in circumstances that presumably resemble those we may expect to meet in the coming months or years Dr JOSEP TRUETA had 2½ years' experience of surgery in Barcelona during the Spanish war, and valuable lessons may be learnt by considering the technique he evolved for the treatment of war wounds and fractures This technique, already described in our columns,[1] is set out in more detail and with some interesting photographs in a small book published last week.[2]

What are the theoretical requirements for a

1 Trueta, J *Lancet*, 1939, i, 1152
2 Treatment of War Wounds and Fractures. By J Trueta M D late director of the department of surgery General Hospital of Catalunya Barcelona London Hamish Hamilton Medical Books 1939 Pp 144 5s 6d

system of treating war wounds and particularly those sustained in air-raid casualties? A standard method that can be adapted to a great variety of injuries is desirable it must deal with the results of both trauma and infection; it must be rapid, the instruments and apparatus used should be simple and few; the injured part should be immobilised in such a way that the patient can be transported away from the danger-zone as comfortably and as soon as possible; and a minimum of nursing and dressing should be necessary. TRUETA'S system fulfils most of these requirements. His first step consists in "débridement" of the wound, which is a thorough excision of all contaminated and damaged tissue, especially muscle, together with the removal of all foreign bodies (unless they are inaccessible) and the opening up of adjacent cellular spaces. Any associated fracture is then reduced, the wound is firmly packed with dry sterile gauze, and the limb is encased in plaster-of-paris which, in the absence of complications, is left in place for two or three weeks; only in exceptional cases is the wound sutured. It will be observed that no part of this system is in itself original, débridement is now generally practised although it is often followed by primary suture, and to pack the wound and encase the limb in plaster is simply to apply to recent wounds WINNETT ORR'S method for treating infected fractures. The result is a method of treating wounds and fractures that is certainly simple and fairly speedy. It can be adapted to many different sorts of injury, and it requires no special apparatus The aim is to prevent infection, but if infection develops it remains localised and, so far as the body is concerned, external. The broken limb is immobilised and the patient is in ideal condition for being transported The wound requires no further attention for two or three weeks Last but not least, the treatment appears to be successful in saving both life and limb TRUETA claims 90 per cent good results and only 0 5 per cent deaths in over a thousand cases of open fractures

This so-called "closed method" has, however, several serious disadvantages Perhaps the most important is that the progress of the wound cannot be watched Serious complications such as gas-gangrene may develop under the plaster, and consequently they may be diagnosed and treated too late TRUETA'S answer is that such complications seldom arise if the débridement has been skilful and thorough, and that when they do occur they can usually be diagnosed, or at least strongly suspected, without inspection of the wound. Danger-signals are deterioration of the patient's general condition, a rapid pulse, local pain, and œdema of the extremity beyond the plaster; in these circumstances the plaster should be at once removed. But this answer is not altogether satisfactory It may be hard enough to diagnose early gas-gangrene when one has all available evidence, local and general; how much more difficult will it be when the wound is encased in plaster. And to remove the plaster in every slightly suspicious case would be to waste much time and often to interfere unnecessarily. Presumably it is only after much experience of this technique that the surgeon learns to interpret correctly the early signs of serious complications Another big disadvantage is the stink, which sooner or later becomes intolerable both to the patient and those near him Apart from general ventilation, no effective counter-measure has yet been devised except to change the plaster and the packing, and to do this frequently defeats one of the most important objects—namely, uninterrupted rest A further difficulty that will sometimes be encountered is that plaster-of-paris is far less effective than continuous traction in controlling deformity in those fractures in which there is shortening maintained by muscular spasm. Despite these faults, however, it is obvious that this method has much to recommend it, and we believe it should be seriously considered by those now responsible for the treatment of air-raid casualties

WHERE CELL TOUCHES PLASMA

THE combined surface of all the red blood-cells in the body is said to be about 3,000 square metres, and its importance in respiratory exchange is obvious On another page Professor FAHRAEUS of Uppsala presents it to us in a new light as something intimately concerned with the life and behaviour of the erythrocyte itself It is not, however, the exclusive property of the cells; it belongs equally to the plasma and is more correctly designated by the term "interface." Its dual significance is proved by the fact that when it is removed, as by segregating corpuscles and plasma, changes occur in both The physical and chemical nature of these changes is unknown, but they both reduce the agglutination and sedimentation time of the red cells and reinforce each other. FAHRAEUS and his colleagues have devoted their attention chiefly to the alteration in the plasma; they postulate the formation, by an enzymic process, of a lecithin derivative similar to that found in cobra venom. Having formed spontaneously in separated plasma, the substance can be removed by suspending erythrocytes for a time in the plasma, and it is therefore held to be adsorbed on to the surface of the cells The cells, besides losing their tendency to form rouleaux (and thus to sediment), then become more spherical, this deformity being associated with an increased tendency to hæmolysis. Since erythrocytes which have been separated for some time tend spontaneously to the same end, and since the spleen is a place where such separation occurs, a plausible theory of blood-cell destruction at once emerges, and is supported, as FAHRAEUS points out in his review, by evidence of increased susceptibility to hæmolysis of cells thrown into the circulation from the splenic stores.

Until all the factors have been thoroughly worked out, the theory must lack precise formulation, but of the significance of the work on which it rests there can be no doubt The experiments have the simplicity of genius It is abundantly clear even at this stage that they will ultimately throw light on many pathological, and it may be on

some metabolic processes The evolution of the research is a striking example of the way in which work in one field will dovetail into that in another, apparently unrelated Not content with his now familiar observation that the sedimentation rate of the blood-cells is greatly increased in pregnancy and certain pathological conditions, FAHRAEUS established agglutination as the cause and examined the various factors controlling this They are numerous, and among the chief seem to be the concentration of globulin and fibrinogen in the plasma, these substances, it is suggested, tend to neutralise the negative electrostatic charge carried by the corpuscles which normally maintains them in a state of mutual repulsion

One of the most fruitful lines of inquiry was the relation of stasis to agglutination, leading directly to an appreciation of the important of BARCROFT'S work on the reservoir function of the spleen and its possible physiological association with prehæmolytic changes KNISELY'S analysis of the splenic circulation suggested to FAHRAEUS'S quick mind that since stasis must be associated with a reduction of the erythrocyte-plasma interface, this surface change and not the mere lack of mobility might be determining corpuscular deterioration Put to the test, this inspiration proved to be well founded and led on to the possible solution of other problems FAHRAEUS suggests that reduction of the interface may not be a local affair concerning only the spleen, where a special mechanism operates to separate the cells from the plasma, but may be significant in conditions such as anæmia and those in which rouleaux-formation occurs in the general circulation To the uninitiated it might seem that this condition would tend to correct itself, since one of the signs of corpuscular damage is a diminished tendency to agglutinate, but FAHRAEUS thinks this tendency is masked by the powerful agglutinating influence of such factors as increased globulin concentration His experiments certainly make it probable that the anti-agglutinative properties conferred by plasma-separation are by no means negligible, and must lead us to inquire how far the spleen contributes to the normal suspension stability of the blood

ANNOTATIONS

DIAGNOSIS OF SHOCK

AT the present time the early diagnosis of shock is of the highest importance, for it is only in the early stages of shock that treatment is of any value Now that blood transfusion services have been organised it has become more necessary than ever to differentiate between hæmorrhage which requires transfusion, and shock in which there is already an excessive concentration of the red cells On another page Mr Layton suggests some guides to practice in dealing with abdominal wounds Moon,[1] from published observations and his own experiments, demonstrates that the earliest sign of impending shock is a rising concentration of the blood as revealed by hæmoglobin estimation by red cell counts and by determination of the specific gravity of the blood Hæmoconcentration often takes place even when the blood-pressure is *rising*, but if this happens a subsequent (possibly fatal) fall in blood pressure can be prophesied with certainty In hæmorrhage, on the other hand a mechanism is at work which tends to restore the blood volume to normal by absorption into the circulation of tissue fluids, this results in dilution of the blood and falling hæmoglobin values and red cell counts A difficulty is encountered when shock and hæmorrhage coexist, here owing to the loss of red cells the hæmoconcentration is comparatively slight in relation to the clinical signs of shock A hæmoglobin estimation though not considered is reliable as a red cell count is the quickest means of verifying the existence of excessive concentration of the blood and treatment of the wounded can readily be based upon its result Thus a falling hæmoglobin indicates the need for blood transfusion, whereas a rapidly rising value shows the need for anti-shock measures such as "forced fluids" by mouth or rectum Plasma transfusion—an attempt to maintain the plasma volume, and a more or less stationary hæmoglobin percentage, in the presence of obvious clinical signs of shock—represents a combination of the two forms of treatment

1. Moon V H *Ann Surg* August 1939, p 261

PROGNOSIS IN PREMATURITY

THERE are many difficulties in any large scale follow up study of prematurely born children, not the least of which is the tendency of parents to move house after an increase in family, especially when this is the result of a first born R S Illingworth has surmounted this difficulty however in an ingenious fashion, relying upon the well known memory of mothers for the birth weight of their offspring He has kept records of 152 consecutive children above the age of one year who at birth weighed 5½ pounds or less irrespective of the alleged duration of gestation, and compared them with similar records of 152 consecutive children who at birth weighed 8½ pounds or more The children were attending the outpatient department of the Hospital for Sick Children, Great Ormond Street, for a wide variety of ailments, all, irrespective of ailment, were included in the series except for four, two in each group, who were suffering from such a gross defect as to make their inclusion unprofitable Illingworth records[1] the results of his studies in various ways, the most important being concerned with the effect of birth weight upon the weight chart Previous studies had suggested that the weight curve of prematurely born infants tended to catch up to the normal at about the age of four years. Illingworth finds, however, that in his series 86 per cent of all the premature infants were under weight at all ages (1 to 12) and only one child in the whole series of 150 fell into the 5 pounds or more overweight group Actually the control series showed 34 per cent underweight but most of these were within 5 pounds of the normal whereas over 21 per cent of the premature series were 10 pounds or more underweight as compared with 1 33 per cent of the control series Illingworth concludes that prematurity must be considered as a common cause of dwarfing and that weight charts which do not take into consideration the birth weight are useless for dealing with the expected weight of any individual child

Another comparison made was concerned with the

1 *Arch Dis Child* 1939 14 121

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incidence of infectious diseases in the two series, since it might be expected that the premature child, being more "delicate," would be more liable to infection than the child of normal weight at birth. Actually he found no difference in the incidence of the infectious fevers in any of the age-groups examined With regard to evidence of cerebral defect however the prematurely born (or, more strictly, the underweight) infant scores badly. The incidence of spasticity, mental deficiency and athetosis was compared in the two series and found to be much higher in the underweight group Gross mental defect, fits or athetosis were present in 20 per cent of the premature group as compared with 6 7 per cent of the control group. Obviously this must not be interpreted as applying to premature infants in general, since Illingworth is dealing with patients brought to hospital because of some disease or defect, but the fact that evidence of cerebral defect is present three times more often among the infants who were small at birth contains food for thought for the obstetrician. A further finding showed an opposite result, so to speak, for the figures for asthma showed that there were nine times as many cases in the control group as in the premature group, and in a small series of cases of infantile eczema also examined only one out of fifty had been below 5½ pounds in weight at birth.

It is clear that there are many factors which may contribute to a low birth-weight—financial status of the mother, her diet during pregnancy, hereditary factors and pathological states of pregnancy—and certain of the findings in Illingworth's study may be related to other causes than mere smallness of size at birth His work should stimulate those with access to similar records, for example among the well children attending welfare clinics or among the records of the school medical service, to sort out some of the points still requiring elucidation. The mortality-rate among premature babies is appallingly high. would its reduction mean the saving of a group of weaklings? Illingworth has supplied some of the answer, but we want to know the rest.

GERMAN MEDICINE IN THE LAST WAR

Prof. A. Waldmann was head of the army medical service on the German side during the years 1914–18 and it may be of interest to look at the achievements of this service through his eyes Five years ago, fearing that the events of twenty years earlier were becoming unreal and almost legendary in the minds of the younger generation, he promoted a special number of the Munich medical journal[1] dealing with every aspect of military medicine and himself contributing a foreword He tells us that of the 26,292 military doctors 1783 (6 8 per cent) lost their lives, the proportion naturally being highest (10 per cent) among the doctors at the front. They handled in all 27 million wounds and illnesses, of which 98 4 per cent. survived and 95 8 per cent became again fit for service These convalescents numbered on the average 67,000 men a month, or almost one half of the supply of fighting material Waldmann estimates that the new hygiene and surgery kept alive a quarter of a million men who would otherwise have been lost Actually some 40 per cent of the men in the field were at no time ill or seriously wounded The mortality from wounds was ten times that from disease and he contrasts this proportion with that of 5 to 1 in the Franco-German war and 1 to 6 5 (note the reversal) in the earlier wars of the nineteenth century On the western front the incidence of typhoid was seven times less in 1914–18 than 1870–71 and a quarter as fatal Smallpox and cholera had no footing, their place being taken by infectious jaundice, five-day fever, and trench nephritis, and he remarks on the curious fact that not only did diabetes and gout disappear "for the duration" but also scarlet fever. Venereal disease never reached its peace-time figure and was only 7 per cent. in the whole army Experience gained in gas warfare had found useful application in industry and sanitation, and finally life in the field was the basis of a life lived closer to nature among the growing generation and had given birth to a new specialty of sport medicine Waldmann concludes with the remark. "Military medicine also, by its fruitful contribution to medicine as a whole, obeys the law that war, in the sense of necessity, is the father of progress in human endeavour."

1. *M inch. med W sch.* 1934, 81, 1157.

EXPERIMENTAL CANCER OF THE LUNGS

THE apparent rise in the incidence of human lung cancer makes it imperative to follow all clues available from experimental work concerning its cause Although the rise cannot yet be satisfactorily explained, a number of relevant facts have come to light It is now known that lung adenomata are the commonest of all spontaneous tumours in mice, that all stocks are afflicted to a greater or less extent, especially as the individuals grow old, and that a susceptibility is inherited as a mendelian dominant All experimental observations have to be interpreted in the light of this knowledge It has also been found that the incidence of these adenomata can be raised by the application of tar, or pure chemical carcinogenic substances, to the skin of mice, without necessarily producing a skin tumour at the same time, that is to say, the tumorigenic effect is seen in an organ remote from the point of application This might indicate that, in seeking the cause of the human lesion, carcinogenic substances should be suspected in sources other than those that can reach the lungs with air—for example, in skin creams that are used regularly Some doubt has now been thrown on such an interpretation, however, by an experiment recorded by Magnus.[1] In an attempt to produce gastric carcinoma in mice by injecting 1 : 2 5 . 6-dibenzanthracene, dissolved in olive oil, through an ingenious adaptation of the stomach-tube, he succeeded unexpectedly in raising the incidence of lung adenomata of his market stock from about 4–8 per cent to 95 per cent. without producing any neoplasms in the stomach. More unexpected still was the unusual finding that 75 per cent. of these adenomata became malignant. The conclusion might have been drawn that here was another instance of a carcinogenic agent acting on the lung from a distance. Magnus, however, went on to test this supposition He delivered similar meals, some containing charcoal and some containing carmine, into the stomachs of mice, and on killing the animals at successive intervals found coloured particles in the smaller bronchi and alveoli This makes him think that in the previous experiment, despite absence of trauma, very minute quantities of the carcinogen accidentally reached and lodged in the respiratory tract According to his calculation the total dose reaching the lungs in six months might have amounted to between 13 and 26 mg It has already been suggested by Argyll Campbell[2] that when lung tumours follow painting of the skin with tar, the tar dries and flakes and is

1 Magnus, H. A., *J Path Bact.* 1939, 49, 21.
2 Campbell, J. A., *Brit J exp Path* 1934, 15, 287.

in fact inhaled as small particles by the mice Campbell[3] has shown also that road dust with a content of only 2 per cent of tar is capable of raising the lung tumour rate from 8 to 80 per cent when mice are subjected for long periods to an atmosphere containing it The active agent in such a dust would probably be very dilute It thus appears that by whatever route the carcinogenic agent reaches the lungs, whether directly with air or indirectly by the blood-stream, the effective dose may be extremely small

COST OF MINIATURE RADIOGRAPHY

THE miniature radiogram as an adjunct to routine physical examination was mentioned in one of our leading articles a fortnight ago, in discussing the death of a militiaman from pulmonary tuberculosis a few weeks after being passed as fit Now A Robinson Thomas[4] has described in detail a simple set up prepared for him by Watson and Sons of Parker street, W C 1 If ordinary 12 × 15 in direct films were used, the outlay on examining 1000 men would be £100 since these films cost about 2*s* each Using 35 mm film mine photographs can be taken on 1 foot of film, and 10½ feet of this film cost 8*s* 10*d* at ordinary prices Using miniature photography, therefore, the cost for 1000 men would be about £2 8*s* The cost of the apparatus used by Mr Thomas, including special developing tanks, screening stand, lightproof cone, miniature camera and lens and also a special projector and screen is about £650 As soon there fore as 7000 pictures have been taken the capital expenditure on the new apparatus has been covered, and the enormous saving in running cost starts to show itself The method is extremely rapid, and Holfelder in his clinic at Frankfurt A M claims to be able to examine 400 cases an hour In Rio de Janeiro, de Abreu[5] is satisfied with 120 an hour Berner[6] has already examined 55 666 patients of whom 32 360 were soldiers and 10 532 picked storm troopers Among the latter, 0 8 per cent was found to have active tuberculosis, while among the German police 1 68 per cent were found by the same method to be infected In spite of mechanisation, personnel is still the most important thing in an army, and miniature radiography can scarcely be excluded from making its contribution to the health of our newly recruited forces on the grounds of expense

THE SOUTH AFRICAN DOCTOR

ACCORDING to Dr Dru Drury[7] there are three defects in the South African medical profession Firstly there are too few doctors There is one practising doctor for every thousand of the European population but if coloured and native population are included, the ratio becomes one doctor for every five thousand Secondly the distribution is faulty One fifth of the Union population live in nine large cities, but this fraction has attracted half of the available doctors Cape Town has one doctor for every four hundred people, while the Transkei has one for thirty thousand natives Lastly medical care is too expensive White doctors fail to settle in native areas, yet Dr Drury says that when the Rockefeller Foundation offered to found a medical school on the Rand for training native doctors the offer was turned down, and natives are not admitted to medical degrees in the existing universities But of the need for a widening of medical practice the recent annual report of the M O H for Cape Town leaves no doubt He writes

> "The social and economic conditions of the Cape Coloured are on the whole unsatisfactory The principle of compulsory education, which is applied to European children, does not extend to them, and although certain schooling facilities are available for them, in many cases of an inferior order, there is much illiteracy, and also a lack of discipline in certain classes of adolescents With a very few exceptions they belong to the working class A small proportion have skilled trades and receive satisfactory wages, but the majority belong to the unskilled labouring class These receive very low wages, usually not more than 30*s* a week when in full work, and often less The wages of the head of the household are commonly eked out by the earnings of his wife and children The City Council pays its labourers a minimum wage of £2 a week, but this is much above the local standard of wages In the building trade the minimum wage for labourers is 9*d* an hour The resulting poverty produces its inevitable result amongst the coloured people A large section of them suffer from malnutrition and their housing conditions are very bad Alcoholism is common and there is a high incidence of venereal disease The effects on their health are shown by the contrast between the vital statistics of Europeans and non Europeans "

The racial distribution of sixth year medical students in South Africa is interesting Jews make up 37 per cent, English 33 per cent and Afrikaans 26 per cent

THE PROPOSED TUBERCULOSIS RESEARCH UNIT

EVER since the discovery of the tubercle bacillus attempts have been made to influence the course of tuberculosis by germicidal drugs—but always without appreciable result Lately the success of surgical measures in cases proving refractory to regimen and diet has pushed the thought of chemotherapy into the background The position is now changed by the advent of the sulphonamide group of drugs, although it would be unwise to argue that they must be effective in tuberculosis because they have given such brilliant results in other infections But if chemotherapy is to find its place in tuberculosis it will surely be as a result of team work, the harmonious cooperation of bacteriologists, pathologists biochemists and clinicians For this reason we share the disappointment recently expressed in the *Times* at the decision of Middlesex county council not to adopt the proposal for a tuberculosis research unit The council has it seems approved the principle, but holds the view that it should be a national rather than a local service The proposal was to ask the Medical Research Council to second Dr Leonard Colebrook who is at present director of the research unit at Queen Charlotte's Hospital, to direct the new tuberculosis unit, bringing with him his own research team The salary of the director would have been paid by the council which would also have provided the raw materials of research from the Mill Hill laboratory Although no results could be guaranteed the establishment of a research unit such as that contemplated could hardly fail to yield information of therapeutic as well as of purely scientific value The record of the unit at Queen Charlotte's has been remarkably good We should like to see it made possible to achieve like results in another field Preoccupation with more obvious foes can be no excuse for wavering in our offensive against Osler's captain of the men of death

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3 Campbell *Ibid* 1937, 18 915
4 Thomas A R *Public Health* Sept 1939 p 347
5 de Abreu M *Amer J Roentgen* 1937 41 662
6 Berner F *Ibid* 1938
7 Dru Drury F G public lecture to the twenty third South African Medical Congress July 10 1939

THE OTHER THIRTY-NINE MILLION

A LARGE proportion of the hospital beds of this country have been cleared for the reception of air-raid casualties, and a large proportion of the medical profession are waiting idle until these beds are filled. Meanwhile the size of the population has not diminished; there is as much illness as ever and in reception areas there is presumably more The Minister of Health recognises this fact, and last April he said it was not proposed in war to keep the ordinary hospital service reduced below its normal level for any length of time, the Ministry, he told a Birmingham audience,[1] had in mind that the ordinary inflow of patients displaced at the outset of an emergency would in a few weeks accumulate again, and would require hospital treatment, and must be catered for. The difficulty arising here is that in a few weeks' time the emergency proper may not even have begun; and until a full attack has been made on our cities, and an equilibrium of forces has been established, we must expect the worst and must not relax our essential precautions That brings up the question how far all the precautions are essential, and we submit that some revision is desirable even at this early stage. Is it absolutely necessary, for example, that London children, of whom perhaps half a million remain at home, should be turned away from the doors of our hospitals when there is an unoccupied staff inside that would gladly give them attention? We beg authorities, great and small, to permit the exercise of that gift for improvisation said to be one of the assets of our race The medical service of the country is largely and inevitably dislocated; but it is *not* inevitable that consent should be withheld for the small efforts made by intelligent medical men and women to supply the needs around them. The requirements of the reception areas will be met in due course, we are assured, by the transfer of practitioners whose work has disappeared. Meanwhile we see obstetricians and paediatricians, eating their heads off in rural hospitals, who are refused permission to start small informal child-welfare or antenatal clinics for the pregnant women and the children evacuated to the villages of the neighbourhood, with whom local doctors frankly cannot cope The Ministry of Health cannot be expected, for the present, to investigate and expressly sanction small undertakings of this kind; but hospital authorities and medical officers of health will deserve no sympathy if they thwart initiative and strangle schemes that will help even a few of the many persons now deprived of the medical help to which they are accustomed Nelson did not win by using his telescope to magnify the wording of the book of rules.

1 *Lancet*, 1939, 1, 795.

MEDICAL WOMEN IN THE SERVICES

THE actual number of medical women who served with the forces of the Crown in various capacities in the last war is not known, but it certainly amounted to many hundreds They were employed on the staff of the Endell Street Hospital in military hospitals at home and in Malta, Salonica and Egypt, and in the last year of the war with the Q M A.A C., the W R N S and the W R A F These groups of women were recruited under different contracts and with different rates of pay and emoluments, so that women in one group never knew whether concessions made to other groups applied to them or not and it was extremely difficult to take any combined action to improve conditions The main disability from which serving medical women suffered was the lack of commissioned rank, which left them without authority over their subordinates and led to obstruction in their professional work and frequent humiliation Those serving in military hospitals were not even allowed to wear uniform until March, 1918

Further, however long and meritorious a woman's service might be she was not eligible for promotion, but was liable to be superseded by any newly joined officer, and she was also not eligible for many of the allowances given to her male colleagues The refusal of the authorities to grant commissions to women was based on the view that they were not capable of performing all the tasks undertaken by medical officers, such as the command of field units and the inspection of recruits The Medical Women's Federation argues, however, that this also applies to male specialists, and that although it was a good reason for limiting the number of medical women employed in war service the utility of women would be no less if they were given commissions In March of last year the Federation stated their case in a memorandum[1] to the Secretary of State for War, and in July Mr. Hore-Belisha replied that "if a woman doctor be employed on military work it is considered that she would be given a grading which would rank with officers of the Army." Unfortunately this vague answer does little to settle the questions of rank, promotion, pay and allowances, uniform and the like which gave trouble before, and requests for further information have apparently been unheeded In this war it may be some time before medical women are employed in military hospitals, but they will undoubtedly soon be attached to the corps of women working with the Army, Navy and Air Force There are many problems connected with the hygiene and medical care of large bodies of women in camps and hostels which can only be dealt with suitably by doctors of their own sex As things stand there is no guarantee that women doctors employed in the Services will have any more definite status than they had in the last war. The conditions of employment should this time be categorically set out as they are in the case of men, so that women may have an opportunity of considering them in detail before accepting them

A MEDICAL LINK WITH SHAKESPEARE

IN 1607 Shakespeare's elder daughter Susanna married John Hall, a physician. Recent investigations have identified him with the John Hall, son of William Hall of Acton, who matriculated at Queen's College, Cambridge, in 1589, and proceeded to M A in 1597. He then went to France to study medicine, and eventually settled in Stratford, possibly as early as 1600. The master of Jesus, in a delightful little volume,[2] has put together a series of apparently unrelated facts which throw a little light on this somewhat obscure personage. He never took a degree in medicine at Cambridge and what induced him to settle at Stratford is unknown. But the master, who can build a pyramid on its apex as well as another man, surmises that his choice may have been due to the connexion of the Lucy family of Charlecote with some property in Bedfordshire which either adjoined that of the Halls or was actually owned by William Hall, the father of John Further surmises make John Hall the source of certain names in Shakespeare's text, for example that of Dr. Caius, and certain phrases peculiar to Cambridge, also of the French in The Merry Wives and Henry V. But surmises apart John Hall physician emerges from the skilful reconstruction of the master as something more than a mere nominis umbra

1. Published in the Federation's *Quarterly Review* for July, 1939, p. 47.
2. Shakespeare's Son-in-law John Hall By Arthur Gray, master of Jesus College, Cambridge Cambridge. W. Heffer and Sons 1939 Pp. 22 2s. 6d

SPECIAL ARTICLES

TREATMENT OF INOPERABLE ABDOMINAL WOUNDS

By T B LAYTON, D S O, M S Lond

SURGEON IN CHARGE OF THE THROAT AND EAR DEPARTMENT GUY'S HOSPITAL, LONDON

WHEN it has been decided not to operate on a patient with a wound of the abdomen, with or without involvement of the chest, treatment consists of an inhibition of peristalsis, rest in the semi-erect position, and the supply of the necessary fluid to the body

INHIBITION OF PERISTALSIS

The inhibition of peristalsis is obtained by giving nothing by the mouth and by the use of morphia Abstention by the mouth must be absolute It is not enough not to give food, no water or other fluid should be given. Anything put into the stomach causes reflex peristalsis The only thing the patient needs to swallow is his own spittle, and there is not much of that It should not be further diminished by the use of atropine, because the dry mouth is one of the things which require attention to secure rest, but only the irreducible amount of moisture to secure this may be introduced and it should not be acid, for the smallest amount of acid sets up peristalsis The moisture is better obtained by stimulation than by supply Barley sugar may be used or a flavoured glucose stick It is well to allow the patient momentarily to suck this at short intervals and not to put a piece within the mouth In this way relief of dryness is effected with a minimum of swallowed spittle Alternatively the old fashioned preparations of glycerin of borax or of honey of borax may be used, placing small quantities upon the tip of the tongue

This absolute stoppage of all swallowing must be considered the main treatment The inhibition of peristalsis obtained thereby is supplemented by the use of morphia by injection This must be used freely and fearlessly, but it is important to remember that its use must be watched and studied It is a weapon that must be used like a rapier and not as a neolithic club To place a syringe and a phial of morphia in a registered medical man's hands no more makes him a doctor than to put a full grained bat in a boy's hands makes him a Hobbs or a Grace One of the most wonderful exhibitions in therapeutics that I have known was when an experienced physician kept a patient out of pain for a fortnight with tincture of opium in doses of 4-5 minims at intervals of four to six hours. And so it should be with the wound of the abdomen At first a large dose may be given to ensure sleep after the mental strain Then it should be the aim to keep the patient in a stuporose state just free from pain This must be done by constant watching and judging The dose and the interval must vary each time It cannot be done by leaving routine doses to be given at stated intervals The fear of producing a morphia addiction must not, at this stage enter the mind It is a fight for a life When this is saved there will be a prolonged convalescence in which any tendency to addiction may be eradicated

REST IN THE SEMI-ERECT POSITION

The upright position was devised by Fowler in America The idea was to drain any infective material within the abdominal cavity into the pelvis where absorption is less there than it is from the region of the diaphragm and liver and where the antibactericidal properties of the peritoneum were said to be greater The position is, however, of as great value in wounds of the lung and in the bronchiolitis of influenza as it is in infective conditions of the abdomen, and with these lesions its value rests in the way in which the lowest and hindermost parts of the lung can become ventilated without undue muscular exertion It is probable that this is as important in lesions of the abdomen as the drainage into the pelvis The best position is not strictly upright The body from the shoulders to the pelvis is at an angle of 45° with the horizontal and with the vertical The hip, knee and ankle-joints being all flexed at right angles, the thigh leg and foot are at the same angle in alternate directions

In 1907 Lane, noticing that the patients tended to slip down in bed, put a pillow under the knees To two of its corners he tied pieces of bandage, the other ends of which he fixed to the head of the bed He thus anchored the pillow to the bed and prevented it from slipping towards the foot In this way he retained the patient in the desired position This is the origin of the appliance that subsequently became known as the Lane pillow The improvisation is still invaluable when this pillow or other appliance, known as a 'donkey,' is not available Without some such thing beneath the patient's knees no nurse ever has kept or ever will keep a patient in the desired position The use of this appliance has as a result of confusion of thought, fallen into disrepute of recent years This is because it has been almost entirely used for patients upon whom non-infective civilian surgery, often gynæcological, has been performed, and a high proportion of cases of thrombosis of the veins in the pelvis has accompanied its use This is not surprising The surgeon has interfered with the circulation of this region by division of vessels and with his ligatures, and the patient often middle-aged and stout, has remained in this position for three weeks Further, in these cases the surgeon does not need the absolute rest that is essential to the patients under consideration in this paper It is good for them to be moved from the very first and then with increasing range to move themselves If, then they slip down a bit they can be hauled up afresh by the lift of two skilled nurses But when absolute rest is required, this repeated hauling exhausts the patient When these patients have slipped down, it is distressing to see them They lie on the lower part of the chest, so that with every inspiration the whole of the trunk has to be raised before any air can be drawn into the lower lobes of the lungs Since the body cannot flex forward in the dorsal region an acute bend develops in the cervical region bringing the chin down and narrowing the upper opening of the chest, so that the jugular veins become compressed, and the retention of the blood in the head adds to the distress caused by its deficient oxygenation Sometimes nurses become indignant when told that they cannot keep a patient in the desired position without the retaining pillow or appliance. They think it is a criticism of their personal skill Fear of raising indignation in the heart of an individual nurse must not be allowed to endanger the recovery of the patient, for it is upon the absolute rest that this position ensures that after the inhibition of peristalsis, the patient's chance of recovery depends Its primary purpose is to prevent any infected fluids from trickling about the abdomen while the protective adhesions are forming, but it aids in that inhibition of peristalsis that has already been considered and it is also a valuable factor in the treatment of shock

Rest must be absolute The nurse must for the time being give up all her routine with regard to the washing of the patient and attention to the skin. This specially applies to the back where the development of bedsores must be risked In this regard there is an advantage in the donkey beneath the knees. Without it the weight

of the body drives the pelvis down the bed, rucking up the upper part of the gluteal region with the area of the buttock, so that lesions tend to arise at the junction of the upper part of the gluteal region with the area of the sacro-iliac joint. With the "donkey" the contact comes upon the hinder surface of the upper parts of the thighs as far up as the gluteal fold, the pressure is more widely distributed

In another respect also the "donkey" is conducive to rest. Many persons, especially in middle age, cannot rest comfortably with the knees extended They must bend the knees, and to obtain the flexion they either roll sideways or flex the hips Both of these cause movements, and the latter also cause the heels, on which sores may develop, to slip down the bed as the patient relaxes the muscles when dropping off to sleep. The result of this is that he wakes again with a jerk, and the much needed sleep is impaired

The same principle applies to the head and neck They must so be propped with pillows that the muscles of the neck are not in play to preserve the balance of the head If they are, the moment the patient drops asleep these muscles will relax and the head flop sideways or forwards, waking him up again; or the head will bend backwards, and there he will fitfully sleep with the mouth open and suffer the more from dryness of the mouth when he awakes. The profound sleep, which helps recovery so much, depends largely on this position of the head It is best for the neck to be slightly flexed The patient does not want to stare at the ceiling If the head is turned towards the entrance to the ward, he can open the eyes when anyone comes in and satisfy his curiosity without any movement In this position also the nurse can get the necessary attention to the mouth without undue movement. If, however, the patient wants to, he should be allowed to move the head If he is restless, he may be persuaded to keep the body quiet if he is allowed to move the head, and, if he will, the arms

In the acquirement of absolute rest some patients may be hindered by their sensitiveness to noise There are some persons whom any trivial sound keeps awake. For them the ear-plugs that are obtainable may make all the difference Without them they stare wide-eyed round the ward, with them they sleep soundly.

SUPPLY OF FLUID

The third requisite in the treatment of an inoperable abdominal wound is the supply of fluid to the body Primarily this is to prevent death from thirst, but it has its place in the treatment of shock.

The old distinction between shock and collapse is not made today, shock being the diminution of the difference between blood-pressure in the aorta and that in the venæ cavæ from a reflex disturbance due to excessive sensory stimulation, whereas collapse is a similar diminution due to the loss of fluid from the body or from its diversion into some part of the body from which it cannot be restored into the circulation. The important thing to remember is that with shock, as defined thus, time is a favourable factor once a decision has been made that nothing is to be done that will determine further shock If an operation is imperative, there is a race against time to diminish the present in order to enable the patient to withstand the further shock of that operation. In the cases under consideration no such further shock from operation is anticipated. There is therefore no race against time.

The absolute cessation of further sensory stimuli that we call rest, combined with the application of heat, is the essential treatment of shock Any attempt to hasten recovery may impede it. Every additional treatment of shock involves some disturbance which may do more harm than the treatment does good There is no doubt that there have been patients whose chances of recovery have been destroyed by an excessive business in the treatment.

Judgment becomes still more difficult when, besides the shock, there is also collapse, as defined above This may be due to loss of blood or to an exudation into the damaged tissues When loss of blood has been excessive and has been stopped, it is advisable to replace the lost fluid at once. There is no quicker method of doing this than by the mouth, but, by the nature of the case, this route is interdicted and also it is not known whether the bleeding has been stopped or not, so that we are dependent entirely upon the natural arrest of hæmorrhage Now, in its lesser degrees, shock is a part of this natural arrest It is therefore undesirable to bring the patient out of the state of shock too rapidly. It is true that there is a further loss of fluid, not out of the body but out of the circulation in the form of exudation into the damaged tissues, as they swell up, and into its cavity, as the peritoneum becomes inflamed. This loss of fluid is, however, gradual It does not need replacing rapidly. It must be forestalled by a slow but continuing supply This is best given through the rectum, but, although the technical apparatus for its administration has advanced enormously, the question of how long and at what rate it can be administered has been forgotten It is not generally recognised today that rectal infusion can be continued without cessation for a period of forty-eight hours or more at the rate of half a pint an hour In 1907 nurses were doing this with an equipment which consisted of a piece of rubber tubing attached at one end to the nozzle of a Higginson's enema syringe and at the other to a bent piece of glass The long arm of the bent glass went to the bottom of a pint measure containing saline, and this stood in a bowl containing hot water to keep the saline warm The hot water was replaced from time to time and the saline refilled from hour to hour. The bowl stood upon the locker by the bedside, raised 12-18 in. above the level of the bed What her mother did with this crude appliance thirty years ago the nurse of today can do with her modern apparatus, once she is told that it is possible and has it made clear that it is demanded of her.

LATER TREATMENT

The rest, the warmth, the morphia and the rectal infusion may be tried for six hours after the patient is in bed If at the end of that time there is any improvement it may be continued If the patient is barely holding his own or there is a set-back, then is the time to decide whether the saline is to be increased by injection into a vein or supplemented by transfusion of blood And so the treatment should continue for three days. It is then that the absorption of twelve pints a day by the rectum may have begun to fail, and it is then that injection into the subcutaneous tissues either into the axilla with a needle through the pectoral muscle or into the submammary tissue may be of value. It is then also that the giving of food must be begun, and for this administration by the mouth is necessary. It still should be such that the peristalsis set up by it is minimal, and therefore anything containing extractives or a residue must be avoided, and it must not be hot A thin gruel at body temperature with sugar added, or albumin water with some glucose may be used The quantities given at first must be small One way is to give a teaspoonful every minute for an hour by the clock, by which time the patient will have had some 8 oz. of the fluid It is not necessary to have a trained nurse for this; a convalescent patient or a relation may do it; but it is necessary to have a watch, or too much will be given; and it is necessary to have the head slightly bent and turned to the side to

avoid any movement that will tire the patient by the frequent offerings of the spoon After this time larger quantities may be given at longer intervals, but rules cannot be laid down, for the doctor and the nurse must feel their way If this treatment be carried out, the nurse will never have to disturb the patient for from five days to a week, except for the passage of urine or possibly for the opening of the bowels, but this is likely not to occur if the peristalsis has been completely inhibited

At the end of a week it will be known whether the patient is likely to recover or not and the treatment becomes more active But one thing is certain at this stage he must not be moved

HUMAN GENETICS

As noted by our Scottish correspondent on Sept 2 the seventh International Genetics Congress opened in Edinburgh on Aug 23 The papers covered an enormous range of subjects, but those dealing with human genetics will be of greatest interest to our readers

Dr I LUNDHOLM (Ostersund, Sweden) discussed the *cause of hypochromic anæmia* He said that as a result of his researches he had come to the conclusion that underlying the disease is a simple dominant gene, the effect of whose presence is to impair the absorption of iron from the intestine In some persons the defect never becomes manifest, but if there is a loss of blood, anæmia follows owing to the slow absorption of iron The regular loss of blood during menstruation amongst women or reproductive age is sufficient to produce the anæmia in bearers of the gene, it is therefore seen very largely among women aged between 15 and 50 Men who bear the gene do not suffer from the disease nearly so frequently, amongst those who do there is often a source of hæmorrhage such as an ulcer or hæmorrhoids In some cases there is no apparent source of bleeding; it may be that in these persons the gene combines with such factors as lack of vitamins or infections

In a session devoted to *statistical methods* in human genetics, it became clear that the refinement of mathematical techniques has proceeded very far The difficulties inherent in the study of human material can be largely avoided if data are collected in systematic (but quite simple) ways and if suitable methods for analysis are then employed The contributors to this discussion were Prof R A Fisher (London), Prof J B S Haldane (London), Prof C Gini (Rome), Prof G Dahlberg (Upsala), Prof L T Hogben (Aberdeen)

Dr D P MURPHY (Philadelphia) described an extensive investigation on the children of mothers who had produced a *congenitally malformed child* The cases were obtained from death returns and represented in all probability, a good random sample of such children The chance that any subsequent child born to the mother would also be malformed was about one in eight, twelve times the expectation in the normal population The commonest malformations were hydrocephalus spina bifida and anencephalus In sibships containing more than one malformed child the type of malformation was usually, but by no means always, the same in the affected sibs Advanced maternal age was a factor of much importance

Dr BARBARA BURKS (Cold Spring Harbour) described genetic linkage between *hair colour* and *deficiency in the number of teeth* This has been demonstrated with a relatively high degree of probability and if finally confirmed will represent a notable landmark in the history of human genetics for it is the first demonstration of linkage in any pair of chromosomes other than the sex chromosomes

MENTAL DEFECT

Dr T A. MUNRO and Dr L S PENROSE (Colchester) have found that *phenylketonuria* (inability to break down phenyl alanine combined with low-grade mental deficiency) behaves as a simple recessive character There is some evidence, inconclusive as yet, that this gene may reside upon the same chromosome pair as the ABO blood groups Dr Munro, however, in answer to Professor Haldane (London) thought that it was premature to discuss this possibility further until more data are available Dr PENROSE stated that there was a genetic basis for *mongolism*, for a mongol child is ten times more likely to have a mongol relative than is a low-grade defective who is not a mongol Maternal age is well recognised as an important factor in the etiology of this condition, but it also plays a part in many others, including for example, pyloric stenosis

Dr J SANDERS (the Hague) described a family containing sixteen persons who suffered from *Pick's disease*[1], this is the largest group yet recorded The age at onset is about forty to fifty years, but it is possible that the application of mental tests may reveal the presence of the gene a considerable time before the disease becomes manifest The disease depends upon a dominant gene, so that diagnosis amongst the children of affected persons is of much practical importance if marriage is contemplated Up to the present the warning given by the mental-test results has been confirmed subsequently in three cases

Dr J A FRASER ROBERTS (Bristol) drew a distinction between *high- and low-grade defectives* The former are part of the normal curve of variability of intelligence and, in so far as heredity is involved, owe their mental state to the operation of multi factor inheritance Low grade mental deficiency may be of exogenous origin, but more often heredity is involved The genes which cause low grade deficiency are very numerous, each being responsible for a small proportion of cases only They are sometimes genes which affect other bodily systems also They include many genes which are expressed in a proportion of the bearers only In many of these last cases, the other necessary predisposing factors must be prenatal It is possible that such a gene makes its bearer unduly sensitive to minor variations which could not affect the development of the normal fœtus, trivial differences would then determine whether the central nervous system was affected or not in a particular bearer of the gene

Dr R J A BERRY (Bristol) described an analysis of the mental characteristics of the *relatives* of a large group of *mental defectives* The most striking finding was the notably higher proportion of affected children if a parent was also affected

MENTAL ILLNESS

Prof D K HENDERSON (Edinburgh) made a close analysis of eugenics in relation to *insanity* He considered that both negative and positive eugenics were involved in a constructive programme, but emphasised that improvements of environmental conditions must also be regarded as essential to such a programme It is easy to encourage too fatalistic a view of the hereditary determination of mental disease He would not be prepared to sacrifice the members of families containing manic depressive patients in order to reduce the incidence of the disease for such people, who might well exhibit slight degrees of abnormality, often possessed qualities which were of value to the

1 Pre-senile dementia *not* polycerositis

community. While not ruling out sterilisation as a useful procedure in a few selected cases, Professor Henderson criticised the findings of the departmental committee on sterilisation (1933), in that the indications suggested were so vague. He also criticised the German plan because it was so sweeping and might interfere with early treatment

Dr. F. J. KALLMANN (New York) stated that the inheritance of *schizophrenia* could be interpreted on the basis of a single recessive factor. This factor, however, was not always expressed and external circumstance may determine not only whether the bearer becomes affected or not, but also the features of the mental breakdown He did not consider that sterilisation could play anything but an insignificant part in eradicating this disease

BLOOD-GROUPS

In discussing *blood-groups*, Dr. V. FRIEDENREICH (Copenhagen) described the division of "A" into three varieties, distinguished by the strength of the reaction. A_1 is dominant to A_2 and A_3, and A_2 to A_3; A_3 is very rare, but the distinction between A_1 and A_2 is already employed medico-legally on the Continent, thereby increasing the proportion of cases in which false accusations of paternity can be disproved. An important piece of work by Dahr was mentioned. It is possible that persons of constitution AA may soon be distinguished from those of constitution AO This would still further increase the usefulness of the blood-groups in medico-legal work. Dr. G L TAYLOR (London) issued an impressive warning in regard to the danger of error in MN blood-grouping. The sera may easily contain unwanted antibodies and so give false positive results, or by over-exhaustion be rendered too weak and so yield false negative results. Further the sera may quickly lose their potency. Statistical examination of much published data obtained from all over the world clearly shows that many such records must contain a proportion of false results MN blood-grouping, especially of course in medico-legal work, is a procedure which should be left to serologists of experience.

Prof. R. RUGGLES GATES (London) discussed blood-groups from the anthropological point of view, and stated that while gene A probably arose in the common ancestors of anthropoid apes and man, gene B in all probability arose much later by parallel mutation in both stocks. Dr D. J. FINNEY (Harpenden) produced evidence which indicated that allergic disease may be linked genetically to the ABO blood-groups (the genes being situated upon the same chromosome pair). This however requires further confirmation.

TUMOURS

Dr. ALMA HOWARD and Dr. C L HUSKINS (Montreal) have found that the incidence of *mammary cancer* in various strains of *mice* is associated with the chiasma frequency, that is, with the frequency with which crossing over occurs between the chromosome pairs at certain stages Dr. MADGE T. MACKLIN (London, Canada) has analysed a series of human *twins* in which both members developed tumours. Some of the material was collected personally and some from the literature Out of thirty-four pairs of identical twins thirty-two showed the same kind of tumour occurring in the same organ, while two had tumours of different kinds Out of fifteen pairs of fraternal twins seven had the same type of tumour and eight dissimilar tumours In cases in which the age at onset was known, the mean difference in the case of the identical pairs was 1 3 years and in the fraternal pairs 12-1 years

ANIMAL EUTELEGENESIS

In the animal-breeding section a session was devoted to *artificial insemination*. This technique is now very widely used in agricultural practice throughout the world, and has attained a high degree of perfection in such animals as cattle and sheep Dr. J. ANDERSON (Naivasha, Kenya) stated that the artificial insemination of cattle was especially valuable in Kenya owing to the prevalence of genital disease transmitted by coitus About 12,000 cows per annum are now being inseminated The farmers themselves carry out the technique after receiving instruction In sheep the results are very nearly comparable to those obtained by natural methods Dr. T BONADONNA (Milan) stated that about a hundred centres were now at work in Italy and her colonies, some 80 per cent. of their activities being concerned with cattle. Other animals yield very successful results however; in sheep 80 to 90 per cent of pregnancies result; in mares 70 to 80 per cent, if more than one insemination is made during the heat period; in sows 90 per cent.; and in hens 90 to 100 per cent. Dr. R W PHILLIPS and associates (Idaho, U.S A) have experimented with long-range *transportation of rams' semen* and have obtained pregnancies after transportation for 2600 miles The longest interval between collection and successful insemination was 115 hours.

Dr. M. TEODOREANU (Bucharest) described particularly successful results in sheep, obtaining 96 5 per cent. of pregnancies, a figure equal to that of normal mating Dr J EDWARDS and Dr. A WALTON (Cambridge), who have been responsible for many advances in this field, described a careful investigation on factors controlling the fertilizing and storage properties of the semen of a group of bulls; further advances in technique may be anticipated in the near future.

Dr. M MANRESA and associates (Philippine Islands) have conducted experiments since 1930 to determine why *pure-bred cattle imported from countries* of temperate climate should prove unsuited to the Philippine Islands. Imported cattle had a much lower hæmoglobin content in the blood than native cattle. This is interpreted as a temperature effect, for variations in external temperature were associated with blood variations in the imported animals, though not in the native ones. The body temperature of the imported cattle was consistently higher than in the native cattle. It is concluded that high temperature and high relative humidity raise the body temperature of the imported animals with serious effects on the physico-chemical balance of the blood. Cross-bred progeny proved to be intermediate.

A feature of the congress was the wealth of demonstrations and exhibits. Particular interest was aroused by the demonstration on blood-grouping and taste-testing (for the ability to taste phenyl-thiocarbamide) arranged by the Galton laboratory of the University of London. Many visitors were blood-grouped and taste-tested, and at the end of the congress members were invited to observe an attempt to test the taste reactions to this substance of the anthropoid apes at the Edinburgh zoo

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". . . 'There is no reason whatever to believe that the order of nature has any greater bias in favour of man than it had in favour of the ichthyosaur. . . . I perceive that now the universe is bored with him, is turning a hard face to him, and I see him being carried less and less intelligently and more and more rapidly . . . along the stream of fate to degradation, suffering and death'"—H G. WELLS, quoted in a review *Nature, Lond.*, Sept. 2, 1939, p. 397.

THE MOTORISED FIELD AMBULANCE

It is a well known principle of warfare that whereas both sides begin a war with the tactical ideas of the last war but one, the medical arrangements are based on the last war but five or six This cannot be said of the R.A.M.C in "Hitler's War," since the modern field ambulance has been entirely motorised, whereas the whole R.A.M.C at the beginning of the last war had at their disposal only seven motor ambulance cars [1] The questions now arise whether this mechanisation has gone far enough and whether it requires a radically altered organisation to make it fully effective Lieut.-Colonel Dowse [2] suggests that the modern field ambulance may not have kept pace with the enormous mobility conferred by mechanisation on the fighting arms He considers that, as now organised and equipped, it is not sufficiently mobile to carry out its primary duty of collecting and evacuating wounded, and that the present system of evacuation from the regimental aid post via the advanced dressing station to the main dressing station and thence by the motor ambulance column to the casualty clearing station is too cumbersome In the first place, 48 of the personnel of the field ambulance cannot be seated in the vehicles of the unit, and this must seriously handicap its mobility Secondly, Colonel Dowse maintains that the heavy ambulance is unsuitable for its purpose and that the number of motor ambulances in the forward area is inadequate

The essential change that Colonel Dowse would like to see made is the abolition of the main dressing station The surgeons say that 90 per cent of wounded should be in their hands for treatment as soon as possible after they become casualties irrespective (within limits) of the length of the journey What then is the purpose of the main dressing station, at which little operating can be—or is in fact—performed? Its abolition, together with its bulky equipment now carried by the headquarters company of the field ambulance, would allow all the personnel of the field ambulance to have a seat in motor vehicles The casualty clearing station, however, may be as much as 50 to 100 miles behind the forward troops, and therefore a forward operating centre of the C C S will be required, as was being developed at the end of the last war If cases are evacuated directly from the advanced dressing station to the casualty clearing station it is obvious that a great increase in the motor ambulances working in the forward areas will be necessary, and this would be obtained by absorbing most of the ambulances in the motor ambulance convoy into the "forward evacuating unit"—the name which Colonel Dowse suggests for his new organisation There are two duties of the field ambulances which would have to be transferred to non divisional medical units administered by the D M S or D D M S of army or corps respectively these are the tasks of establishing rest stations for sick and wounded who are likely to rejoin their units in a few days, and of gas centres for the special treatment of gas casualties Neither of these organisations needs to be mobile and the transfer from division to corps or army would be an advantage rather than otherwise

In view of its greater mobility the present cavalry field ambulance seems to be nearer the ideal than the infantry field ambulance but under the proposed organisation a single type of field ambulance will be suitable to work with all types of divisions, thus securing a desirable uniformity Colonel Dowse would prefer to see a proportion of the light two stretcher type of motor ambulance included in the forward evacuating unit, and he thinks that motor cycle stretcher carriers might be developed as in the French army The motor ambulances of the forward evacuating unit would consist of 20 heavy cars with H Q, and 5 heavy 10 light and 10 motor-cycle stretcher-carriers, or an additional 10 light cars, with each company, giving a total of 95 per division As regards personnel, Colonel Dowse supports the suggestion that bearer officers—i.e., promoted N C O s of the R.A.M.C—should be in charge of the evacuation of the forward areas, thus releasing qualified medical men for more essential services.

Thus Colonel Dowse envisages a divisional field ambulance or forward evacuating unit of a uniform and highly mobile type, whose duties would be confined to establishing advanced dressing stations, collecting the wounded and dispatching them to the C C S or its forward operating centre, to the rest station or to the gas centre As has been well said, a field ambulance is doing its duty best when it is empty

[1] Official History of the War Medical Services, vol 1, p 52
[2] J R A M C June 1938 p 374

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

EDINBURGH IN WAR-TIME

One of the results of the medical A R P organisation in Scottish cities is the temporary disappearance of the hospital population In Edinburgh evacuation of the patients in the Royal Infirmary and the three municipal hospitals was carried out The seriously ill patients were accommodated in convalescent homes, public assistance institutions and so on, but, whereas before the war nearly 3000 beds were occupied by persons presumably requiring hospitalisation, only about 300 are now occupied The discharge of so many patients to their homes has thrown an enormous amount of work on the general practitioners at a time when their numbers are greatly reduced and many of them are hard at work on various A R P duties At the same time, the diagnostic services of the hospitals have stopped In the efforts which have been made to cater for civilian casualties, medical services for those who happen to fall ill during the initial stages of war have been rather overlooked Already however, the situation is coming under control In Edinburgh the public assistance institution is being rapidly converted into a general hospital and some of the beds in the Royal Infirmary are to be liberated from war purposes to supplement those which have so far been used for ordinary emergencies The infirmary will continue to hold empty 1000 beds in readiness for air raid casualties In radiological departments, the more time-consuming and laborious barium examinations are to be restarted shortly Needless to say, emergency radiology of fractures and so on, has not ceased

A R P IN THE UNIVERSITIES

The dramatic changes which have overtaken other public buildings in the last few days have not passed by the universities Apart from the sand bagging of the more important parts departmental staffs have been busy packing and placing in safe storage valuable apparatus specimens and other teaching and research material In Edinburgh continuous fire patrols of the university buildings are being organised, students

forming the personnel with members of the staff acting as leaders. The professorial staff has worked wonders in the rapid construction and equipment of first-aid posts and shelters In the medical school, ground-floor rooms in the anatomy department and the rooms of the students' reading room have been protected and well equipped with the necessary running water, sterilisers, dressings, stretchers, &c., while a canteen for the aid-post team is rapidly being finished The bowels of the earth are hollowed out into troglodyte shelters, into which, like threadworms in the appendix, everyone will crowd when the warbling sirens start

EAST FORTUNE SANATORIUM

Some time ago the Air Ministry announced their intention to acquire the ground about East Fortune Sanatorium for use as a landing-ground. The sanatorium authorities objected that the existence of the sanatorium and a landing-ground were incompatible, and that the institution, which accommodates 211 patients and serves the whole of the south-east of Scotland, would have to be given up. It has now been announced, however, through Mr. George Mathers, M.P. for the Linlithgow division, that the Ministry have decided not to proceed with their scheme.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month, his name can be seen later in the half-yearly index

FROM D.P.M.

III

THE engineer deputed to reorganise my black curtains stood on the top of the ladder and delivered me a short address on Hitler. There was nothing strikingly new about it except that, in his opinion, Hitler was no leader. "I always say," he repeated, "that he's not a leader." I could think of no satisfactory reply to this, so he went on to tell me what his wife thought about the war; and here I found myself in my depth again, for his wife and I seem to share the same views

"I've blacked out our bathroom light," he said earnestly, "so that we get one little beam on the mirror for me to shave by. My missus said to me: 'Is that all the light we're going to get, then?' I said, 'Yes, my girl, that's all, till the war's over!' 'Cor,' she says, 'no light, no pictures, and nothing but music on the wireless. What do they think we are?'"

What indeed? No-one can deny that the atmosphere of Victorian piety in which this war is being conducted has grown thicker and thicker during the past week The niggardly crumbs of news doled out to us are no compensation for days which end at dusk, and nights spent in rooms muffled in black curtains and heated to the temperature of a moderate oven Even threatened air-raids are so well supervised that the wretch going through the streets is hurried down some hole in the ground by an air warden before he has a chance to explain his phobia (supposing he has one) of being buried alive All this paternal solicitude is very nice—but boring. Of course we should be grateful; we should be pleased to find ourselves safe, and to know that any news that might cause us a moment's uneasiness is being kept from us Perverse and foolish, however, we are as restive as children under the thumb of a too solicitous nanny, the sort who insists interminably upon a body-belt and a dry pair of socks.

Surely we could be treated more successfully as adults? What objection could there have been, for instance, to giving us at once the text of those leaflets dropped over Germany by our airmen? There was a splendid adventure, if ever there was one. Surely we deserved to hear that tale in full?

Is it just possible that this silence and organised gloom is part of a deep-laid scheme? Can it be that someone has at last realised that the way to make warfare universally and permanently unpopular is to make it boring? There is a strong strain of asceticism in mankind. Men and women will put up with unthinkable agony and grief if they believe it to be a good cause. On the other hand, no cause has yet been found to make boredom seem attractive. Or anyhow, to make it seem attractive to me and the engineer's wife, and I daresay there are plenty like us

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This question of boredom is very interesting. Boredom must often have been responsible for wars, though no-one could complain that boredom led up to this one. Bored children squabble, bored nations, perhaps, go to war. In the Middle Ages, it has been suggested, boredom led to witch-hunts. Among villagers isolated from any sort of entertainment a suspected witch must have been a godsend. Among the border clans a chief at his wits' end to occupy a body of highly trained and quarrelsome clansmen must have been thankful to suggest a raid on someone else's cattle. In these situations the change was from a static to an active phase, a loosing of chained energy

But suppose we could reach a point where the reverse was the case, where the constructive activities of peace gave more outlet for our energy, skill and even our aggression, than the disciplines of war? Suppose war became the passive, boring phase, under which we fulminated to an uproarious and active peace? That would be a thing worth seeing. It would not necessarily mean the end of war, because human institutions are apt to be cyclic; there is a time for building up, we are told, and a time for breaking down But it would mean that wars were brief and unpopular—dull interruptions of our more violent deeds.

* * *

The emergency medical arrangements appear to have been carried out with great speed and accuracy; hospitals have been cleared for casualties and important units moved out of the danger zone. It is pleasant to know that some of the hospitals are evacuating their younger nurses to outlying institutions. London may seem dull at the moment, but there is no guarantee that it will remain so The seventeen- and eighteen-year-old nurses looking after London's mentally defective children are staying where they are with a very good grace.

One drawback to the emergency arrangements as they affect the civil population is beginning to show itself. A friend of mine in general practice tells me

that he sent a case of just operable cancer to all the hospitals in his region, but could get no treatment for her Many other doctors must have encountered similar difficulties The status of the civilian in wartime is always rather mysterious Presumably the army fights to protect the civilian, yet the civilian is always neglected in favour of the army He gets worse food, worse medical care and worse gas-masks It all seems very curious Either the civilian is worth protecting—in which case he is worth preserving, too, or else he is not worth protecting—in which case, why keep an army? I can't make it out

* * *

I suppose there are good reasons for training nurses to have blind faith in the doctor—except that I cannot suppose there is any really good reason for training anybody to have blind faith in anybody else Sometimes the trust of the nurse is stimulating and sometimes embarrassing, and *sometimes it makes one* wonder what goes on in the nurse's mind I have known a nurse refuse to admit she was looking after a case of pneumonia though she had been nursing the patient perfectly for a week, and had herself copied the word pneumonia on to the temperature chart in capital letters She said that she didn't like to own she knew it was pneumonia for fear the doctor would think she was making a diagnosis

I provoked one staggering exhibition of blind faith during the first air raid warning While I was waiting in one of the wards with a first aid squad the telephone rang, the voice of my senior officer came briskly over the wire "Fill the bath!" I turned to the nearest nurse—"Fill the bath," I said "Yes, doctor," she replied breathlessly, bolting like a rabbit into the bathroom A moment later her flushed and earnest *face appeared round the bathroom door* "Hot or cold, doctor?" If the incalculable creature chose this moment for a dip, hers not to question, I suppose she felt She put me in mind of Casabianca, whom I admire but cannot respect

* * *

A minor pleasure of war is to be found in filling sandbags Half the hospital turns out for this sport and prosecutes it with enthusiasm I did not realise until instructed by the gardener—who looks like Lloyd George but is less loquacious—that there is an art in filling a sandbag A full team consists of three one to delve and one to hold and one to tie the sacks They put me on to holding at first, that being the simplest job, but after a short trial Lloyd George shook his head and beckoned to one of our mental defectives to show me how it was done It seems you have to hold the back lip of the sack firmly, with your hands about eight inches apart and the canvas taut between them, the front lip of the sack then sags forward, leaving space for the introduction of the shovel It was some time before my performance satisfied the gardener After that they let me dig a little, and here again there are points to be observed, a sack must not be filled too full or it refuses to lie flat when banked among its fellows, and the shovel—our shovels are nearly as wide as the mouths of the sacks—have to be introduced tenderly or half the load trickles out and is wasted I discovered no special points about tying except that it blisters the left little finger

At first we filled the sacks from our meagre garden, with the result that some of them are now sprouting green blades and lending the wartime aspect of the hospital a hoary appearance already; later a fair portion of Clapham Common arrived on lorries and enthusiasm reached a high pitch I think the children felt that Bognor Regis had come to town, and greeted us on the morning round with "Doctor, can *I fill* sandbags? Can I fill sandbags, doctor?" Large and tireless parties gather on the imported dunes in every spare moment, using anything they can get, from seaside spades to ornamental fire-shovels, and the growing piles of sandbags lie round them looking like the malt sacks out of "This is the House that Jack Built" The padre who arrived hopefully to conduct a service was completely out of the running "You tell him he can go home and pray for us, sister," the patients said kindly to the worried messenger

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT 2, 1939

Notifications.—*The following cases of infectious* disease were notified during the week Smallpox, 0, scarlet fever, 1035, diphtheria, 756, enteric fever, 77 (53 "expected"), pneumonia (primary or influenzal), 301; puerperal pyrexia, 149, cerebrospinal fever, 18, poliomyelitis, 21, polio-encephalitis, 1, encephalitis lethargica, 1, dysentery, 26, ophthalmia neonatorum, 28 No case of cholera, plague or typhus fever was notified during the week

Deaths.—In 126 great towns, including London, there was no death from smallpox, 1 (0) from enteric fever, 2 (0) from measles, 3 (0) from scarlet fever, 5 (4) from whooping-cough, 14 (0) from diphtheria, 44 (6) from diarrhœa and enteritis under two years, and 8 (1) from influenza The figures in parentheses are those for London itself

Liverpool reported the only death from typhoid Fatal cases of diphtheria were scattered over 12 great towns, South Shields and West Bromwich each reporting 2 Liverpool had 9 deaths from diarrhœa, Birmingham 6, Nottingham 5

The number of stillbirths notified during the week was 231 (corresponding to a rate of 33 per 1000 total births), including 40 in London

The Lancet 100 Years Ago

From an article on small pox in Chelsea by Dr W B Marshall

I CARE not to mingle the question of money with that of the public health, and am not, therefore, solicitous to suggest any mode of remuneration for the authorised vaccinators, but I may add that the cost of coffins alone, for small pox patients, during the year ending April 30th, 1839, would, I am sure, have more than paid for the vaccination of every one who has been attacked with that disease during the same period, a clamour might, and, doubtless would, be raised against any law to that effect, upon its first introduction, but, like all senseless clamours, it would soon subside, and as the law came into operation, the benefits thereof would be better appreciated, and, of course, more cheerfully acceded to

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"You shall always be told the truth in this war May be that at the front there is a serious reverse—that shall not be hidden from you. If listening to foreign radio stations is heavily punished, it is not because we fear them, but because it is dishonourable to listen to the dirty tirades of foreign countries"—Field Marshal Goering in a Berlin armament factory on Sept 9

"You can drop a bomb somewhere but you can broadcast the truth everywhere"—Sir WALFORD DAVIES quoting his taximan in a broadcast on Sunday evening, Sept 10

LETTERS TO THE EDITOR

RED CROSS AND ST. JOHN JOINT APPEAL

THE following letter, signed by the Duke of GLOUCESTER, Sir ARTHUR STANLEY and Lord SCARBROUGH, has been issued to the press by the Red Cross and St. John Emergency Committee

In the grave issues which now confront the British Empire, the British Red Cross Society, of which H.M the Queen is president, and the Order of St. John have decided to work together as they did in the last war with results which are still within the memory of the public With this object a Joint Emergency Committee has been set up, comprising an equal number of members of each body. Lord Cromer has consented to be the chairman of the committee with Major-General Sir John Kennedy as vice-chairman.

In this war, which is so entirely different from any that has preceded it, it is impossible to foresee exactly where relief for the sick and wounded will be most needed, or in what form But it is certain that there will be vast suffering and distress and that the relief of the sick and wounded of His Majesty's forces, and of the civilian population, will call for much voluntary effort and financial support Considerable voluntary help has already been secured but it remains to find the money necessary to pursue the work. In the great war, and indeed at all times, appeals made by the British Red Cross Society and the Order of St John received the most generous response, showing that the heart of the Empire is with those who are risking their lives in support of the rights and liberties, not only of the peoples of the British Commonwealth of Nations, but of the whole civilised world

We earnestly ask you to help the Joint Committee in the great work that lies before them. A fund is being opened in the name of the joint bodies Donations should be sent to The Hon. Sir William H Goschen, K B E , hon treasurer, Red Cross and St John Fund, at Messrs. Coutts & Co , 1, Park Lane, London, W.1

DIPTEROUS LARVÆ AND WOUND TREATMENT

SIR,—When troops wounded in battle have been lying out on the ground, unattended for some time, their wounds very commonly become infested with larvæ of certain kinds of flies In the war of 1914–18 W S Baer [1] noticed specially that when the wounds had acquired about their maximum maggot population they did not exhibit dangerous after-effects On the other hand, men whose wounds had received prompt early treatment often developed infection It was found that the presence of these larvæ was especially beneficial in cases of osteomyelitis. It was discovered that the larvæ were eating the necrotic tissue which was supporting the main bacterial infection and, at the same time, these larvæ were inhibiting further bacterial growth Stewart [2] claimed that the scavenging larvæ play an important part in clearing the necrotic tissue, but that calcium carbonate, which is constantly excreted by the larvæ, is also important in alkalising the medium (the wound), in which the bacteria live, and of increasing phagocytic activity The larvæ used in the earlier treatment of osteomyelitis belonged chiefly to the species *Lucilia sericata* (Meigen), *L cæsar* (L) and *Phormia regina* (Meigen) Stewart [3] showed, however, that due precautions must be taken and a proper knowledge of the biology of these larvæ is essential. Some species will feed on both necrotic and normal tissue and are potentially dangerous to the latter.

Much study has been devoted to the technique of rearing dipterous larvæ under aseptic conditions, and also of retarding their normal development, until they were actually needed for implantation within wounds Sterilisation of the eggs in a 5 per cent solution of formaldehyde, mixed with a 1 per cent solution of sodium hydroxide, for five minutes has been found satisfactory by Robinson [4]; he gives full details of this process, and that of the subsequent rearing of the larvæ Livingston and Prince [5] were successful in eliminating the inconvenience and unpleasantness associated with the actual "maggot therapy" by using a sterile extract of the creatures themselves Robinson [6] claimed that the blow-fly larvæ contain allantoin in their excretion and that the rapid healing of wounds as the result of "maggot therapy" is due in the main to this agent He did not claim, however, that it could be entirely substituted for the application of the living larvæ Robinson carried his investigations further and found that a watery solution of allantoin provides the necessary healing agent, without the presence of dipterous larvæ at all In 1935 allantoin was a rare chemical in the laboratory but it soon became to be made synthetically. Robinson also pointed out that a part of the allantoin molecule can be split off by hydrolysis to form urea. Further work led to the discovery that a 2 per cent watery solution of urea has the equal healing properties of allantoin or of the fly larvæ themselves It has the further advantage of being much cheaper than allantoin Not only osteomyelitis, but many other kinds of non-healing wounds, have been treated in the manner just described—including gas-gangrene, heat burns, X-ray burns, and varicose and diabetic ulcers So far as I am aware Paramorow in 1934 [7] was the first to use dipterous larvæ in the treatment of gas-gangrene He applied maggots of the house-fly, *Musca domestica*, since calliphora larvæ were prone to devour healthy as well as necrotic tissue He states that he cured three cases of gas-gangrene when amputation appeared inevitable, and that the healing process began 48 hours after the treatment began.

In this brief summary I have stated the present position of the subject in so far as it is known to me. It is desirable, at the present early stage in the world calamity that we are facing, that the foregoing information should be made as widely known as possible There is no doubt that further research into the technique of this method is urgently required Also, I believe that it is correct to say that this method of wound treatment has been more widely explored in the U.S.A than in England The literature on the subject is already extensive and I have only mentioned a few of the chief writings here.

I am, Sir, yours faithfully,

A. D. IMMS, F.R.S.

Zoological Laboratory, Cambridge, Sept 7, 1939

1. *J Bone J Surg* 1931 13, 438
2. *Surg Gynec Obstet* 1934, 58 155
3. *Ann trop Med Parasit* 1934, 28, 445
4. *U S Dept Agric Bur Entom Ser E* 1933, p 311
5. *J Amer med Ass* 1932, 98, 143
6. *J econ Ent* 1937, 30, 41
7. *Z weiss Insektenbiol*, 1934, 27, 82

NEUROSIS OR PSYCHOSIS?

SIR,—Far be it from me at the present time to embark upon, or to encourage, controversy on this endless theme As, however, you referred to my writings and views in the leading article from which this correspondence arose, I may perhaps be allowed to make two brief statements on the matter

The first is that if the suggestion that an anxiety neurosis and a melancholic depression have anything in common with each other in either ætiology, symptoms, course or treatment, is to be accepted or even to pass unchallenged, I for one should feel that our terminology and psychopathology were futile from beginning to end, and should withdraw in despair from any further attempt at argument or discussion I fancy that I should do so in fairly good company The second is that it is unfortunately possible that we may all before very long have ample opportunity to observe the greatness of the gulf that separates neurosis from psychosis I pointed out several years ago that no better help to the differential diagnosis exists than an air raid No one who has experienced an air raid in the company of a number of both neurotics and psychotics is likely ever again to be in doubt as to whether the difference between the two is "quantitative" or "qualitative" I need not say that I share the universal hope that we shall be spared this acid test, and I trust that Dr Symonds and Dr Gillespie may be able to compose their differences without having to wait for it Of course, any observant mental hospital physician who has noted the reaction of the patients in his "convalescent" wards to a thunderstorm could say a good deal about the profound difference between neurosis and psychosis, but his evidence would, I fear, be regarded as tainted

Is it so very difficult to admit that even a psychosis must have a beginning, and that it may very often be undiagnosable or misdiagnosed at first, even by an experienced man? I cannot think that anything is gained—and the reputation of our specialty is certainly damaged—by confidently labelling an early, doubtful or undiagnosable psychosis as a neurosis, and endeavouring to have it both ways by asserting that the one may turn into the other

I am, Sir, yours faithfully,

HENRY YELLOWLEES

Harley street, W 1, Sept 11

"DORMANT" LEAD POISONING

SIR,—I hope it may be my mistake, but I seem to detect some hint of superbity in Dr R E Lane's comments on the above subject His experience of industrial lead poisoning is not in question, his knowledge of lead poisoning in war conditions has yet to emerge If he will read my letter again he will see that I have not ascribed symptoms to lead that had been absorbed many years previously' These cases to which I referred had been absorbing lead up to the time of their joining the army perhaps two or three years before I saw them, sometimes less This is not many years" A considerable incidence of lead poisoning, diagnosed on clinical and haimato'ogical grounds, was apparent for the first time after joining up I should be more strictly accurate if I said that a considerable incidence of *acute* symptoms was seen, many of the older patients had suffered from constipation and other symptoms, possibly due to lead for long periods I claim to have made a clinical and haematological observation and to have drawn from it a not unreasonable deduction as to one aspect of lead intoxication My case records perished long ago so that I cannot give precise details

When Dr Lane has had a similar experience he will be in a better position to plead for "a more critical attitude" and to condemn 'a seemingly plausible explanation" as if his middle name was Tarquin I trust he will not mislike the comparison

I am, Sir, yours faithfully,

GORDON WARD.

Sevenoaks, Kent, Sept 9

A WAR-TIME PHARMACOPŒIA?

SIR,—In the present circumstances it is imperative to study forthwith means of preserving supplies of certain substances which, although widely prescribed, have little or no therapeutic value Syrups, used solely as flavouring agents, edible oils and fats as ointment bases, alcohol in many tinctures, are instances of valuable substances which could be replaced. Belladonna pulverata, digitalis pulverata, and ergota preparata could be given in tablet form instead of the corresponding tinctures and extracts This would mean the saving of alcohol and in addition, owing to the reduction in bulk, storage and transport problems would be simplified *Now* is the time to devise a war-emergency pharmacopœia for the whole country A small committee of representatives of the medical and pharmaceutical professions would have little difficulty in compiling a national formulary Such a pharmacopœia is an urgent necessity

I am, Sir, yours faithfully,

H DAVIS,
Chief Pharmacist

University College Hospital, London, W C 1, Sept 7

EXPOSURE OF THE FACIAL NERVE

SIR,—Mr Morris's article on the surgical treatment of facial paralysis (*Lancet*, 1939, Sept 2, p 558) prompts me to record an easy method of approach to the facial nerve trunk This I devised some forty years ago I used to chisel off the tip of the mastoid process, with the insertion of the sterno mastoid The muscle and mastoid are turned downwards, thus exposing the nerve as it emerges from the stylomastoid foramen It can then be followed with ease in either direction I used this exposure first in cases of catarrhal palsy, which I now generally treat with diathermy

I am, Sir, yours faithfully,

W KENT HUGHES

Melbourne, July 12

FOR TRACHEOTOMY CASES

SIR,—I feel that arrangements should be made for patients who have to wear tracheotomy tubes to be given some protection against gas Evacuation or if this is impossible their admission to a gas proofed hospital ward would seem the most convenient way of dealing with the problem

I am, Sir, yours faithfully,

W A MILL.

Harley street, W 1, Sept. 11

UNIVERSITY OF CAMBRIDGE.—We understand from Dr Russell Reynolds that he has not resigned his examinership for the diploma in medical radiology, as stated in the *Cambridge University Reporter* and in our issue of Sept 2 Dr Keeley is taking his place for the October examination only

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

FROM the day on which the Emergency Powers (Defence) Bill was passed through all its stages, including of course the royal assent, on Aug. 24 until to-day Parliament, the machinery of the defence services, the civil services, the industrial and business life of the nation and every other aspect of our lives have gone through a series of rapid changes. It is not only that Great Britain, the Dominions, India and the Colonial Empire have gone to war, it is that we have gone to war in an organised and deliberate way more like the stage of growth in some living creature than the work of millions of brains and millions of hands. The nation has been equipping itself for the possible danger of war in an intensive campaign ever since last year—and our preparations before that were on a great scale, but during that period the mind of Parliament and the nation has also been changing and equipping itself as perhaps never before in history.

When the final day had all but come and Parliament met on Friday and Saturday Sept. 1 and 2 there was not only organic change visible, there was a passion for righteousness visible as a consuming fire. When at 7.44 p.m. on Saturday Sept. 2 the Prime Minister rose to make his speech on the situation between Germany and Poland members were tense with expectation, for we had been sitting discussing important bills—but discussing while waiting for the all-important announcement expected. And when the Prime Minister's statement came it revealed delaying tactics by the Germans, failure to reply to the British demand that hostilities between Poland and Germany should cease, and a proposal from Italy for an immediate conference of Great Britain, France, Poland, Germany and Italy. It also contained a statement that Great Britain would not agree to a conference while Poland continued to be invaded, and that Great Britain did not recognise the German pretence to have annexed Dantzig to the German Reich But it did not contain a declaration breaking off relations with Germany, and the passion in the hearts of M.P.'s of all parties swept into a tumultuous expression of anger. When Mr. Greenwood, leader of the Opposition, rose he was greeted, from the Tory benches, from the mouths of ex-cabinet ministers, from the Labour benches and from the Liberal benches with a roar asking for a lead for Britain. "Speak for England" called out two former Tory cabinet ministers; "Give a lead" called other members Words could barely be heard in the roar of many voices expressing many feelings, but all united in the passionate desire to show unmistakably and definitely where Great Britain stood.

In that flame of a passion for righteousness the new Britain was born The trend of events in Europe over a year had been paralleled by changes in the structure of our country like those in some vast chrysalis Iron and steel and concrete defence taking the place of the softer structures of peace; large, swift acting and complex nervous mechanisms of central and departmental control superseding the more leisurely ways of normal days; new organs of offence in the air, on the sea and on land growing in power monthly, weekly, almost daily And above all a change in spirit. Hatred of war among all classes, full realisation of horrors of war among all classes, and yet a determination, deep founded, expressed sometimes with difficulty but practically everywhere · "We've got to have done with this Hitler business." Then Parliament met on Sunday. The actual words of the Prime Minister in the House of Commons on Sunday morning were to announce the fact that during the night an ultimatum had been sent to Germany demanding a reply by 11 a.m., that no reply had been received and that we were in consequence, when the statement was made, already at war. All members had known this before from the air-raid warning which wailed over London soon after 11 a.m. But the actual words gave a feeling of profound relief The change from the old order to the new was made. Britain was at war—not against Germany, but against Hitlerism.

* * *

Since Sept. 1 the work of Parliament has gone on regularly and in the new way—acts being passed by the dozen, often going through all their stages in one session, in order to give Government the powers it needs Opposition and Government, not unity in one government but unity in a new form of association in which Opposition members act as critical advisers to the Government. The rights of discussion and free speech maintained, the freedom of the democracy carefully safeguarded for the future, the right of parliamentary criticism emphasised

Already there have been two interesting medical results of that. On the Personal Injuries (Emergency Provisions) Bill introduced by Sir Walter Womersley, the Minister of Pensions, constructive criticism elicited that the Government were paying especial attention to the cases of head injuries and the "shell shock" class of case On the main conscription measure, as the result of criticism, the Minister of War gave a definite undertaking that he would not send youths under 20 overseas unless the emergency demanded it and unless he had previously (if possible) consulted the House and given it the opportunity of criticism. The objection to sending boys of 18–20 overseas was the medical one that they were not hard enough for this work and that it was a waste of man power, because a a misuse of man power, to do it

The work of Parliament is to go on. The House of Commons will meet usually each week and it will keep all vital matters under review. But it is a House with a new spirit There is no division in the feeling that the nation has entered on a righteous war against Hitlerism and that it must be pursued until the Nazi government and all it stands for is swept out of existence And after the War? Already men and women are thinking in terms very different from those of 1914–18. There are no heroics about this war and no heroics in Parliament.

The future must be remade, and remade on a basis of realistic and objective observation Medical science and the other sciences will play a greater part in the future than they have in the past. The problem of adequate nutrition, for example, must cease to be a problem for all classes of the population.

From now onwards the mind of Britain is directed to the war. The great machine of offence and defence created by Democracy moves on; it will go on relentlessly and irresistibly, but it is not motived by hatred of any people, it is inspired by the love of freedom.

MEDICAL NEWS

Drug Fluctuations

The price of crude iodine has advanced by 30 per cent, this will affect quotations for tincture of iodine, potassium iodide, sodium iodide and all iodine preparations The price of quicksilver has also been raised by some 30 per cent, which will justify a rise in the cost of calomel corrosive sublimate and all preparations of mercury The cost of bismuth metal is higher, and makers of bismuth carbonate and other bismuth compounds have advanced their quotations by about 10 per cent There has been a substantial increase in the cost of quinine sulphate and other quinine salts, prices are based on the Dutch florin which, like the American dollar, has moved against sterling, up to the present the rise in the price of quinine sulphate is about 20 per cent Caffeine and theobromine are dearer to a similar extent, the prices of both being based on Dutch currency To a smaller degree the prices of methyl salicylate, phenazone benzoic acid, sodium benzoate, methyl salicylate and menthol have also been advanced Practically all drugs of vegetable origin are dearer to a varying extent, in due course the higher prices will be reflected in quotations for tinctures, extracts and other galenical preparations, and also alkaloids In the case of vegetable drugs dealers who hold supplies are rationing their clients where it is necessary or advisable to do so, with a view to conserving stocks until these can be replenished The same applies to medicinal essential oils It should be mentioned that an addition of about 5 per cent may be made to the price of all drugs in order to cover the war risk insurance of stock which is now compulsory

Surgical Instruments Wanted

The regional commissioner for Scotland announces that as a result of the large hospital extensions, heavy demands are being made on manufacturers of surgical instruments and appliances It would be a public service if private institutions and nursing-homes, medical men and firms, possessing surplus stocks, large or small of the following would communicate with the Secretary, Department of Health for Scotland, 121A, Princes Street, Edinburgh Artery forceps and other commonly used surgical forceps, surgical clamps, towel clips, hooks, retractors; surgical knives, osteotomes, hypodermic syringes, bedpans, catgut, irrigator stands, sterilising packs of any type, fish kettles, accurate lotion thermometers for use in X ray departments, and any other of the more common surgical instruments and apparatus The department of health for Scotland is prepared either to purchase or to take on loan any of the articles mentioned provided, of course, that they are considered suitable

Norwegian Tuberculosis Conference

The Nordisk Tuberkulose Laegeforening held a conference in Trondheim from June 23 to 25 at which Denmark, Finland, Norway and Sweden were represented by their leading specialists The two main subjects discussed were the relationship between the primary infection and destructive pulmonary tuberculosis and the indications for thoracoplastic operations Speaking on tuberculin tests one delegate mentioned that he has found that by repeating tests frequently on the same subjects it is not very rare to find definitely positive reactions giving place to negative reactions It was generally agreed that considerable, if not absolute protection can be conferred against tuberculosis by inoculating tuberculin negative reactors with B C G, and approval was expressed of the principle of vaccinating with B C G those who after the age of 12 are still tuberculin negative even if they are not living in tuberculous surroundings One of the most important communications was made by Dr Andersson of Gothenburg who on a follow up study of about 1000 children inoculated with B C G between 1927 and 1937 showed that not one of them had developed tuberculosis On the invitation of Swedish tuberculosis specialists, it is hoped to hold the next conference in Sweden in 1941

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on Sept 4, with Dr John Henderson, the president, in the chair, Dr James Cuthbert (Kelso) was admitted to the fellowship

Commissions in the R A.M C and the A D C

Doctors who wish to place their services with the Army should register their names with the Central Emergency Committee of the British Medical Association, and should not apply direct to the War Office Qualified dental surgeons wishing to obtain commissions in the Army Dental Corps should communicate with the Central Dental War Committee, 13, Hill Street, London, W I, or, if resident in Scotland, with the Scottish Central Dental War Committee, care of the Department of Health for Scotland, Edinburgh, 2

Emergency Medical Service

In the House of Commons on Sept 7 the Prime Minister said that over 200,000 hospital beds were now ready for air raid casualties, 56 500 of these were in the London region, 15,500 being inside the county and 41,000 outside The beds in any region would of course be available to meet the needs of any other hard pressed area Over 11,000 trained nurses, 4000 assistant nurses and 50,000 auxiliary nurses had joined the Civil Nursing Reserve for service in hospitals or first aid posts but more trained nurses and auxiliaries were needed, especially women who could give whole time service in any part of the country. Nearly 2500 doctors had accepted enrolment in the emergency medical service and acceptances were being received daily

Relief for Evacuated Persons

The Unemployment Assistance Board has been empowered to pay allowances to people in distress arising out of the war, even though they are not within the ordinary unemployment assistance scheme Persons applying for relief must be over 16 and must provo evacuation from home under a Government plan and to be in need as a result, or that he or she, or the person on whom normally dependent for support, has been deprived entirely or to a substantial extent of normal means of livelihood by the war Allowances will be calculated on the same scale as the ordinary unemployment assistance allowances and will be subject to generally similar provisions regarding the treatment of resources

Hospitals in Northern Ireland

A general survey of the hospitals in Northern Ireland has been made and information has been collected of the number of existing beds, the number of additional beds which could be accommodated in existing premises, and as to the sanitary arrangements and equipment The Minister of Home Affairs has appointed Dr I M B Allen to be Hospital Officer, and he has drawn up a memorandum in which the organisation of the Emergency Hospital Service is explained

The hospitals have been classified into four groups Group 1 includes the hospitals in Belfast which will receive general and special casualties, group 2 the hospitals outside Belfast which be in areas in which casualties may also be expected to occur, and which will be expected to receive such casualties and also casualties from the outlying parts of Belfast

The hospitals in group 3 are those situated outside the area in which casualties may be expected to occur and these will receive only unexpected casualties from their own neighbourhood but will be expected to maintain medical services for ordinary patients who might otherwise go to hospitals in groups 1 or 2, and to receive such patients and convalescent casualties from hospitals in groups 1 and 2

Group 4 is made up of hospitals in Belfast with specially limited equipment or accommodation upon which no demand will be made except in exceptional need.

EMERGENCY NOTICES

The examining board in England of the Royal Colleges of Physicians and Surgeons announces that (1) The final L.R.C.P. and M.R.C.S. examinations, advertised to begin on Sept. 27, will, it is anticipated, begin on that date. Certain relaxations in the regulations for admission have been made. (2) The first examination in anatomy, physiology, materia medica and pharmacology, advertised to begin on Sept. 20, will, it is expected, begin on or about Oct. 18, and the date of entry has been extended to Tuesday, Sept. 26. In view of certain relaxations which have been made in the regulations for admission to this examination, candidates who have not already entered are advised to write at once to the secretary of the examining board. (3) The pre-medical examination in chemistry, physics and biology, advertised to begin on Sept. 18, will, it is expected, begin on or about Oct. 23, and the date of entry for the examination has been extended to Monday, Oct. 2. (4) Certain modifications in the conduct of these examinations are necessary, and candidates must be prepared to be examined outside London. (5) The offices of the secretary of the Examining Board in England, at the Examination Hall, Queen Square, London, W.C.1, will be open from 9 A.M. to 4 P.M. daily from Monday to Friday, and will be closed on Saturdays.

The temporary address of the central administrative offices of the University of London is Royal Holloway College, Englefield Green, Surrey.

The university session at Manchester will probably begin as arranged on Oct. 5. Students from St. Mary's Hospital medical school, London, will be transferred to Manchester to continue their studies there.

Full Term will probably begin at Oxford as arranged on Oct. 15.

University College, London, has moved to Aberystwyth, and communications should be sent to it there, care of University College of Wales.

The work of the Glasgow Post-Graduate Medical Association has been suspended indefinitely.

The central offices of the Queen's Institute of District Nursing are being moved to the Hermitage, East Grinstead. (Tel. East Grinstead 129.)

The offices of the *British Dental Journal* have been temporarily removed to 5, Westleigh Road, Barton Seagrave, Kettering. All the other activities of the British Dental Association will for the present be carried on at 13, Hill Street, W.1.

The Royal Sanitary Institute has cancelled its classes of instruction and sessional meetings until further notice. The work of the institute will continue to be carried out at 90, Buckingham Palace Road, Westminster, London, S.W.1, and should this become impossible at "Darroch," Harrow Road West, Dorking, Surrey. (Tel. Dorking 2877.)

The public and private business meetings of the Association of Industrial Medical Officers have been cancelled until further notice. Communications regarding the association should be addressed to the hon. secretary, Dr. D. Stewart, 50, Frederick Road, Edgbaston, Birmingham, 16.

The office of the Ross Institute of Tropical Hygiene has been moved to 29, Inglis Road, Ealing, London, W.5. (Tel. Acorn 1534.)

The annual meeting of the International Society of Medical Hydrology, announced to take place in Italy from Oct. 14 to 19, has been indefinitely postponed. The office of the society at 22, Bedford Place is being kept on for the present, but the October number of its *Archives of Medical Hydrology* will not be published, and general office activities are being reduced to a minimum.

The annual meeting of the British branch of the International League against Epilepsy has been abandoned.

It has been arranged by the sector office that the Central London Throat, Nose and Ear Hospital in Gray's Inn Road shall continue its normal work, as the other throat, nose and ear hospitals are closed.

The National Hospital for Diseases of the Heart, Westmoreland Street, W.1, has been closed, but has reopened for the reception of inpatients at Maids Moreton Hall, Buckingham. Doctors requiring information should apply to the R.M.O. at that address. (Tel. Buckingham 2235.)

The St. Thomas's Hospital old students' dinner, arranged for Oct. 6 at the Dorchester Hotel, has been cancelled.

Until further notice the address of the Medical Women's Federation will be 73, Bourne Way, Hayes, Bromley, Kent. (Tel. Hurstway 1904.)

The London offices of the Royal Medical Benevolent Fund have been closed and the more important registers and records have been moved to Wormingford Grove, Wormingford, Essex. For the present it is impossible to consider giving financial help to any new applicants.

The emergency headquarters of the Pharmaceutical Society are at Birdgrove House, Mayfield, near Ashbourne, Derbyshire. The offices at 17, Bloomsbury Square, London, W.C.1, will remain open for the present to deal with urgent business. For the time being the *Pharmaceutical Journal* will be published at 23, Bloomsbury Square. The college of the society is housed at University College, Cardiff, and the various courses of instruction will be distributed between the University College of South Wales, the Technical College and the Welsh National School of Medicine. The society's pharmacological laboratories have been transferred to Reading. The September examinations have been postponed because a number of candidates have been called up for service.

The Royal Cancer Hospital, Fulham Road, are now able to receive and treat a limited number of cases of malignant disease. The outpatient and X-ray therapy departments are working as usual.

Royal Appointments

Sir Thomas Dunhill has been promoted sergeant-surgeon to the King and Colonel Benjamin Biggar, F.R.C.S., has been appointed hon. surgeon to the King in succession to Colonel J. M. Weddell, who has retired. Major-General Francis Casement, M.B., has been appointed hon. surgeon to the King in succession to Major-General H. M. J. Perry, who retires on Sept. 26. Mr. G. Gordon Bruce, F.R.C.S., is to be a surgeon to His Majesty in Scotland.

Arrangements at Ventnor

Realising that the war has thrown all efforts to treat tuberculosis into confusion, that many cases of tuberculosis have been discharged from sanatoria half-way through their treatment, that many others will be denied the benefits of treatment, and in addition that there will be many cases left in unsuitable, ill-ventilated, sandbagged houses who will be a danger to others, Dr. Fairley, the county medical officer of the Isle of Wight, has arranged with the Ministry of Health to take over two *holiday camps* to be run in conjunction with the Royal National Hospital for Consumption, Ventnor. It will accordingly be possible to deal with cases requiring treatment in bed in the hospital and with all ambulant cases in the holiday camps. It is hoped that ultimately there will be approximately 750 beds available. The camps will have a capacity of about 250 men and 100 women accommodated in 2- or 3-bed chalets. They will be reserved for *ambulant* cases of pulmonary tuberculosis, and patients will be expected to make their own beds, keep their chalets tidy, and generally assist in the work as far as their health allows. There will be a resident matron in each camp and any patient suffering from a relapse or any condition requiring treatment in bed will be transferred to the hospital.

WAR PREPARATIONS IN IRELAND

Our Dublin correspondent writes Although Ireland is not—for the present at any rate—a belligerent country, neither the authorities nor the public are neglecting the possibility of its becoming so, and preparations for emergencies arising out of the war are being rapidly pushed forward The hospitals, as well as private householders have been urged to render their buildings as secure as may be against the dangers of air raids It hardly needs emphasising that in the event of a raid reaching Dublin—whether by accident or design—the danger of fire from incendiary bombs would be very great, and there is no building in which a fire is so hard to combat as a hospital It is, therefore, incumbent on the authorities of the hospitals to render the buildings as safe as may be, and it will probably be necessary in the first instance to arrange for the vacating of all top storeys

The provision of hospital accommodation for possible casualties has also to be studied The Irish sweepstakes have not yet succeeded in adding appreciably to the number of general hospital beds in Dublin or Cork, and there is a definite shortage of hospital beds at present To find accommodation in an emergency for some hundreds of additional hospital cases would be, in these present conditions, beyond the power of the Dublin hospitals, but it is understood that the question is being carefully considered

The St John Ambulance Brigade in Ireland, to which the country owes much both in peace and war in the past, has been very active both in training its personnel in air-raid precautions and in increasing the number of its members For the past twelve months classes in first aid and in A R P have been held regularly, and have been attended by several hundreds of men and women On Sept 6, a public meeting to attract recruits for a special reserve of the brigade was held at the premises of the Royal Dublin Society, and the attendance was such as to surprise and even to embarrass the organisers Over 2000 persons attended, and over 1400 fresh volunteers signed forms of application for various classes of voluntary service

The Irish Red Cross Society—powers for the establishment of which was given by legislation last spring—has come into being The Government nominated the first council, but in future the society is to be both self supporting and self managed The President of Ireland (Dr Douglas Hyde) accepted appointment as president of the society and he nominated as chairman of the executive committee Mr Charles Mac Auley F R C S The council is thoroughly representative and contains many members who have a long experience of work in societies with similar general service Among these members are the commissioner of the St John Ambulance Brigade in Ireland (Sir John Lumsden) and members of his district staff Cordial cooperation between the brigade and the society is certain to be secured

Appointments

BACON, EDWARD M B Lond D O M S, hon assistant ophthalmic surgeon to the Royal Hospital Southampton

BECK, ANDREW, M D Glasg D P H, assistant county medical officer of health for Devon and district medical officer of health for the borough of Clifton Dartmouth Hardness and urban districts of Brixham and Paignton

HUGHES, JOHN B Chir Camb F R C S resident surgical officer at the Montagu Hospital Mexborough

JONES, IDRIS G M D Lond., M R C P hon assistant physician to the Cardiff Royal Infirmary

JONES, R M R C S D P H medical superintendent at the Bridge Home Witham (branch of the Royal Eastern Counties Institution)

MACKAY, J D M B Aberd, D P H temporary assistant medical officer of health for Barrow in Furness

MACKINNON, N A M, M B Edin., D P H, deputy medical officer of health for Bury

MELDRUM, C B M B St And junior assistant medical officer at the Argyll and Bute District Mental Hospital Lochgilphead

MILLS, W G Q M B Camb, F R C S resident surgical officer at the Radcliffe Infirmary Oxford

NEILSON, E E, B.M Oxf F R C S, surgeon to the London Hospital

NOWELL, STANLEY, M B Manc D M R E junior assistant medical officer in the radiological department of the Manchester Royal Infirmary

PEARSON, R N, M D Edin, M R C P E D P H, deputy medical officer of health for Middlesbrough

PONTON, BENJAMIN, M.D Manc assistant medical officer in the massage and electrical department of the Manchester Royal Infirmary

REID, J M B Edin F R C S E resident surgical officer at Cumberland Infirmary Carlisle

SUTHERLAND, MARIE S M B Aberd D P H, deputy medical officer of health and deputy school medical officer for Accrington

WILSON, G F, L M S S A temporary medical officer for casualty services for Epping and Ongar

WOLFENDEN, D H L, M D Lond D P H, assistant medical officer of health for Rotherham

Births, Marriages and Deaths

BIRTHS

DOWLER.—On Sept 8 wife of Dr H G Dowler, of Church down, Gloucester—a daughter

HATTON.—On Sept 5, the wife of Dr P L S Hatton—a daughter

JAMESON.—On Aug 29 at Blackheath the wife of Captain James Jameson R.A.M.C.—a daughter

O'MEARA.—On Sept 6 at Catterick Camp Yorks, the wife of Major F W O'Meara R.A.M.C.—a son

PESKETT.—On Sept 4, the wife of Dr G L Peskett, of Newport Isle of Wight—a son

SNOWMAN.—On Sept 11, the wife of Dr L V Snowman of Finchley Road London, a daughter

TURTLE.—On Sept 7, at Bournemouth, the wife of Dr Peter de Boe Turtle—a daughter

MARRIAGES

BULLINGER—LLOYD.—On Sept 10 at Evesham, Owen David Bullinger, M B to Mary Lloyd

CORBIN—BUNTING.—On Sept 4, at Worcester, John Ogilvie Corbin, M B to Elisabeth Mary Bunting M B

CROOK—DYSON.—On Sept 4, at Crookham Parish Church, Aldershot Lieutenant Anthony Crook, M R C S, R A M C, to Roberta May Brabazon Dyson

GREES—UNWIN.—On Sept 4 at Wokingham, Theodor Anton Green F R C S, to Susan Melinda Unthank

HARRISON—HOWES.—On Sept 3, John Ormerod Harrison, F R C S to Mary Bowen

HEISER—NOBLE.—On Sept 2, at Eastbourne, Ronald Brodie Heiser, M B, to Muriel Margaret Noble

LEARY—MCKINLAY.—On Sept 7, at St Columba's, Pont Street Lieut. Colonel Thomas Garnet Stirling Leary, A.M.C., to Annie Eileen McKinlay

LOWN—SANKLIN.—On Sept 2, at Epsom Dr J F Lown to Miss F F Sanklin

MCINTYRE—SHEPPARD.—On Sept 9 at St George's Hanover Square Ivan Gordon McIntyre M B to Anne Lowson Sheed

MCLACHLAN—CANNING.—On Sept. 7, at All Souls, Langham Place Angus Fitch William McLachlan, M B, to Helen M Canning

OLLIVENSHAW—TIMPSON.—On Sept 6 at Didsbury Parish Church Captain Robert George Watson Ollivenshaw B M, R.A.M.C (T) to Kathleen Mary Timpson

PATON—REID.—On Sept 8 at Edinburgh Parish Church Henry Oldham Paton M B to Margaret Elizabeth Reid

PRITE—MACKENZIE.—On Sept 9 at Amberley Frank Richard Pepper B.M. to Patricia Mackenzie

ROSS—MACCOLL.—On Sept 4 at St Marylebone Parish Church Dr T A Ross to Mrs E C Macoll

SHAW—MACCOLL.—On Sept 6, at Beaconsfield Elizabeth Church Colin Carter Shaw M R C.S, to Daphne Vera MacColl

SLOAN—HENRY.—On Sept 8, at Guildford David Robert Sloan M B, to Alice Joanne Henry

STEWART—DICKINSON.—On Sept 4 at Sunbury-on Thames Richard Arthur Stewart M C., M B, to Alice Mary Dickinson

WARNOCK—THOMPSON.—On Sept 6 at Totland, John William Brodie Warnock M R C S to Margaret Thompson

WILLIAMS—HORTON.—On Sept 7 at St Marylebone Parish Church Leslie Charles Williams, M C., to Kathleen Miriam Horton M R C S

DEATHS

BLISSETT.—On Sept 6 at 13 Kelfield Gardens London W 10 George Egbert Brander, M R.A.F assistant medical officer, public health department London County Council

CROOK.—On Sept. 5, Hugh Walter Dowes Crook, M R C S D P M., assistant medical officer Knowle Mental Hospital, Fareham aged 36

GRANT.—On Sept. 6 at Hampstead, Leonard Grant, M D Edin formerly of New Southgate aged 70

LAWSON.—On Sept 7, at Lowestoft Hugh Lawson M R.A.F., late of Chislehurst

LISTER.—On Sept 6 at Johannesburg Sir Frederick Spencer Lister, M.R.C.S. L.R.C.P. Capetown director of the South African Institute for Medical Research aged 63

NOTES, COMMENTS AND ABSTRACTS

THEY ALSO SERVE . . . .

STANDING and waiting is at the moment the order of the day. What are all the doctors doing shut up in their hospitals ready for civilian casualties? Filling sand-bags, digging trenches, or darkening windows? At Guy's, at any rate, it was the students who were invited to turn the Park into a miniature western front (and some may interpret it as a sign of modern decadence, that the free beer supplied by the acting superintendent lasted longer than had been budgeted for)[1] At the Royal Free, it was the fair hands of the unqualified which heaped sand into bags. The doctors are at present, if not technically part of the great unemployed, at least part of the great unoccupied.

A few of us have the Napoleonic capacity for sleeping when, where, and for as long as, we like. For the rest, a few hints on passing the time pleasantly may not come amiss. Darts and billiards are apparently out of fashion, their places being taken by darts-bowls. Hospitals not blessed with tennis courts can still usually find a patch of grass where, before or after dinner, a delightful game may be played A hospital *without a shove-halfpenny board can hardly be called* a hospital. Liquid refreshment should be stored in a cool place and, if supplies are limited, the key of the cave should be placed in trustworthy hands.

But, when all is said and done, there is no better way of passing time with pleasure and profit than with a pipe and book. Shall our emergency reading be light or heavy? Charity begins at home, so for a start, we would remind our readers that buried treasure may be found inside our own covers We have known men who read Gibbon under shell-fire in the front line; with that mighty tale of revolutions, battles and sudden death as a background we see our own times in clearer perspective. Pepys, too, in the unbowdlerised version, is a sound piece of A.R.P. He lived, as we must now live, in day-tight compartments, extracting a maximum of pleasure from every trivial happening. Borrow selling his bibles in Spain transports us to another world. And each of these three books can stand constant interruptions and still survive.

For those who feel that in moments of relaxation a book should not strain the mind by either its matter or its method, there is always Dr. P. G. Wodehouse. His plots are intricate but they are of small importance. Sir Denison Ross recommends him to foreign students as a clue to the classics Lord Dunsany makes one's imagination boggle in "The travel tales of Mr. Joseph Jorkens." Bocaccio and O Henry have the double merit of brevity and wit. Those who turn to Stephen Leacock may like to be reminded that he also wrote "How Lincoln freed the slaves." Light reading is not necessarily fiction. Professor Trevelyan's *story of "The English revolution, 1688 to 1689"* is not only easy, but also apt. Two hundred and fifty years ago, we got through the political growing-pains which now afflict another nation. But best of all is Fisher's "History of Europe," three volumes now happily printed on India paper as one. What a feast it is! We cross the Alps with Hannibal, the Rubicon with Cæsar, the Danube with Attila, and the Vistula with Napoleon, forgetting for a time the painful necessity of crossing the Saar with Gamelin. Fisher and a gas-mask will, we hope, see us through.

TOWN AND COUNTRY NITS

THE thoughtful countryman, confronted for the first time by a hoard of miniature townsmen, is asking himself if, along with other troubles, the evacuated children may not bring pediculi. A glance at the annual reports of the school medical officers suggests that this fear is groundless. In Devon, 98 657 inspections last year revealed 2214 "unclean" heads (2 3 per cent). In East Sussex, pediculi were found in 1 9 per cent of inspected children, and in Warwickshire in 3 0 per cent. In urban areas, the figures are very similar The borough of Bermondsey records only 0 8 per cent. discovered at 105,646 inspections. In the borough of Hendon 2 7 per cent were found at 36,797 inspections. The city of Nottingham was high with 4 0 per cent. at 78,361 inspections. The complaint that the town child is dirtier than his country cousin is apparently no longer justifiable. Some say, however, that while the rural cleanliness may now be soundly based on parental pride the urban cleanliness still has the support of the de-lousing station. At the same time, in the general reshuffle, an occasional child with nits and pediculi may find its way into a home where these are unknown This appears to have happened at Kettering, where a number of evacuees, chiefly unaccompanied children, were found, in the words of the *Northampton Evening Telegraph*, to be suffering from "certain skin diseases, not dangerous, but unpleasant." The borough council actually had to open a private house for treatment of the more obstinate cases In Yorkshire, Alderman Davies, chairman of the North Riding public health *committee, is urging medical examination of evacuees* by evacuating authorities, now that the worst of the rush is over. Such a suggestion must be carefully considered before it is acted upon, for evacuation is more urgent than the detection of minor maladies. The Ministry proposes the removal from billets to empty houses of demonstrably unwelcome guests.

1. Passim, *Guy's Hosp Gaz* Sept. 9, 1939, p. 291

". . . The energies, the abilities, and the knowledge of each and every individual with scientific training must be directed without remission to the service of the Allied cause. Nevertheless, the end to be attained, and the end which science should hold ceaselessly before the eyes of the Allied peoples, is not destruction, but a constructive ideal—to ensure in the future such conditions as will make possible the advancement of all the peoples of the world without discrimination, according to the status and the traditions of each, in the light shed by reason and scientific knowledge To keep alive the aims of science in furthering the pursuit of truth in the universe and the relation of that truth to the developments of man's nature, without regard to tribal and racial distinctions, should be, indeed must be, the ultimate function of the scientific thinker, whatever may be his more immediate preoccupations"—*Nature, Lond*, Sept. 9, 1939, p. 455.

Medical Diary

TUESDAY, SEPT. 19—4 30 P.M. (Tennent Memorial Building, 38 Church Street), Dr. I Chesar Michaelson: Pressure Problems—Ocular, Cerebral and Circulatory.

Vacancies

Birmingham, Romsley Hill Sanatorium—Res. Asst M O, at rate of £240.
Bolton Co Borough, Townleys Hosp—Third asst. M O, £350. Also 4th asst M O, £250
Burnley County Borough—Sen. Asst M.O H, £800.
Chester Royal Infirmary.—2 Hon. Radiologists
Dunedin Hosp, New Zealand.—Radiotherapist, £1100
Hull Corporation Health Department—Asst. M.O H, £600
Kettering and District General Hosp—Jun. H S at rate of £150
Metropolitan Hospital, Kingsland Road, E 8.—Resident Appointments at rate of £100
Plymouth, Prince of Wales's Hosp, Greenbank Road—H S, at rate of £120.
Plymouth, Prince of Wales's Hosp—Sen and Jun H S's for Devonport section, at rate of £130 and £120 respectively.
Preston County Borough, Sharoe Green Hosp—Jun. Asst R M O. at rate of £100.
Reading, Royal Berkshire Hosp—Res H S., H P., and Cas O, each at rate of £150
Royal Chest Hospital, City Road, E C.1—H P. at rate of £100
St. Marylebone Borough Council.—Public vaccinators, £90 and £30 approx. (according to district)
Tottenham Borough—Temporary Asst M O.H (A R P.), £550
Watford Borough—Temporary Asst M O H, £600
Willesden General Hosp—Cas. O, at rate of £100.

ADDRESSES AND ORIGINAL ARTICLES

INOPERABLE CARCINOMA OF THE RECTUM

BY DUNCAN C L FITZWILLIAMS, C.M.G., M.D. Edin., F.R.C.S.

SENIOR SURGEON TO ST MARY'S HOSPITAL, SURGEON TO MOUNT VERNON HOSPITAL AND THE RADIUM INSTITUTE, LONDON

AN Irishman might say that the problem of inoperable carcinoma of the rectum can only be solved by diagnosing it at a sufficiently early stage to render it operable. He would be right. But with some accessible and, more especially, inaccessible carcinoma for many and obvious reasons this is not possible. There must always be a considerable number of patients who are inoperable before they come to the surgeon. Early diagnosis is of the greatest importance, but we deal here with patients who for one cause or another have passed beyond this stage.

SYMPTOMS

In late cases the symptoms complained of are as follows. There is looseness of the bowels, with three, four, or more motions a day; this is the most significant symptom even in early cases. It is especially noticeable with the prominent redundant growth low down in the bowel. Quantities of mucus are passed in the stools, which sometimes consist of little else; it is the mucus that causes the repeated motions. The presence of a tumour low down in the bowel gives rise to that feeling of dissatisfaction when the motion has been passed, as if there were more to come. The presence of blood is variable; it is often present in small quantities but sometimes only in attacks, when much may be lost.

Pain is always a late sign and is of two kinds. There is colic, especially severe with a scirrhous growth, constricting the bowel and narrowing the lumen as if a tape had been tied round it ("string stricture"). This comes on in bouts and is accompanied by rumblings and gurglings—what the patient terms wind, which, if he is observant, he will notice gradually becoming more and more pronounced. Then there is the other kind of pain, the dull ache which is always present. This is partly due to the ulceration and partly to the extension outside the bowel wall involving the neighbouring structures, especially the nerves.

The other symptoms include loss of weight, anæmia from loss of blood, and, more especially, toxæmia due to absorption from the bowel, and a loss of appetite may have become apparent. In advanced cases these symptoms are all found, though they vary in severity from case to case.

DIAGNOSIS

Diagnosis is simple and can usually be made by the finger in the rectum. Less often the sigmoidoscope is needed, and still less often we have to rely on the barium enema and radiography, but both these methods may at times be indispensable. Diagnosis by the barium enema is best made as the fluid runs in and the bowel is manipulated by the hand pressing on the abdomen. It is advisable for the surgeon to be present and to see this done. Photographs are taken as a record of the obstruction and are useful for showing to the relations and even the patient as evidence of what is termed "his stricture." Even when the finger can reach and diagnose the growth, a barium enema is most useful and should always be given. The information thus obtained may save much time if an operation is carried out.

Diagnosis at this stage, after the patient has been ailing for some time, is not quite the shock it is when made early while the patient is yet in robust health, but still it is not pleasant, especially as one cannot be open and frank with the patient. The relations, with whom one is unreserved as to the state of things, and what ought to be done, and the best way of doing it, are often for a while terrified by the catastrophe which they realise is about to befall them.

TREATMENT

A decision has now to be made as to what is the best thing to do, and it is not easy to decide at a moment's notice. It is better for the surgeon to have a talk both with the doctor and with the relations, first separately and then together, before deciding what to advise the patient, and then to tell the people to talk the matter over with the doctor who is, after all, the person on whom they are going to rely more and more in the future and the one whose advice they will most readily follow. It is necessary for the surgeon to have in his mind clearly the possibilities of the case, and the family should also be made conversant with them.

To begin with, the radical operation in the ordinary case in the hands of the most expert has a case mortality of 1 in 5. In the hands of the surgeons of the smaller provincial and cottage hospitals it has a mortality which is presumably much higher. The operation therefore should be considered to be one with a high fatality rate and never to be undertaken lightly. We are only dealing here with the late case.

Next the general health of the patient should be gauged with accuracy. Experience has impressed upon me that the age of 65 is the limit beyond which it is unwise to operate. If the general health has been undermined by the disease, if there is loss of weight, if loss of blood has caused anæmia, or if the patient has become toxic from bowel absorption, the operation should not be urged, and if the cardiac or vascular system is not first class, or if there is diabetes or renal disease, the operation is out of the question. From this it will be seen that there will be many cases which will require some other form of treatment.

Let us discuss the advice we give to a patient who is young and in fair general health, and in whom we are not yet sure that the disease is irremovable. The best thing to do is to perform a laparotomy and to explore the condition through a median incision below the umbilicus. The growth is examined as to its nature, its fixity, and its extensions, together with the glands draining the region, and the possible peritoneal extensions, and above all the presence or absence of metastases in the liver *must* be ascertained.

When we have decided that the state of affairs is such that radical removal cannot be performed, a colostomy should be arranged through a separate opening on the left side. The patient *should* be warned beforehand of the possibility of having a colostomy. The colostomy should be made through a large skin incision and a small incision in the muscles, which should be split. The bowel is pulled up as far as possible, so that the opening is as near the growth as may be and there is a more or less straight passage

along the gut to the growth. This is important for future treatment

The idea of a colostomy is repugnant to most people, but it is astonishing how little a well-managed colostomy incommodes the possessor My patients are all recommended not to use a catheter to wash out the bowel, but to use a stomach-tube, which they pass right round to the cæcum and so wash out the large bowel completely, they then empty it of fluid and are safe for the next twenty-four hours During this time the large bowel gradually fills again, and it should always be emptied at the same hour each day. Nothing could be simpler, and nothing could be more effective A piece of lint and a flat rubber pad are all that is worn over the colostomy opening

A word may be said about the advantages of a colostomy, which in my opinion are very great To begin with, the rate of growth of a carcinoma depends on its blood-supply, vascular tumours grow quickly, whereas avascular tumours grow slowly. Fæcal material passing over a tumour irritates it, causes it to bleed and secrete mucus, and so increases the vascularity and therefore the rapidity of the growth. A colostomy confers freedom from all such irritation. The constant passage of mucus is lessened, the bleeding is allayed, and the general health and well-being are much improved. The removal of the obstruction removes the toxæmia, and all colicky pains disappear; these are great assets to the comfort of the patient, and the outlook on life improves immensely. For these reasons I am in favour of performing a colostomy in every inoperable case

Now let us turn to the patient whose general health, age, or the condition of the growth obviously precludes the possibility of a radical operation. Here we have to make up our minds whether we recommend the patient to have a colostomy performed at once, or wait until symptoms develop which compel us to perform one *In many cases* this is difficult to decide My opinion is that the facts had better be laid before the patient, who should talk the matter over with his wife and his doctor and then decide for himself. I favour a colostomy for the reasons given above, but it is better to let the patient be master of his own fate rather than to urge him in any one direction

Should he decide on a colostomy, the opening can be made in the left iliac fossa. The interior of of the abdomen can be explored through the incision and the inoperability confirmed. There is more liability to the development of a hernia through a large incision in the muscles at this point than if the bowel is brought up through a small separate opening. Again the opening in the bowel should be as near to the tumour as possible for subsequent treatment.

In many cases the age is so advanced, the system so undermined, and the disease so extensive, that it is questionable whether it is worth while doing anything. In these cases a very useful method of treatment can be carried out with conspicuous success in most instances and amelioration of the symptoms in all—namely, the application of radium to the growth It should be made plain to the relations why radium is used No hope of cure should be expressed, but a confidence may be given as to the relief from, and the avoidance of, certain most unpleasant symptoms In most cases too there is a prolongation of life, and a not too unpleasant life. There may even be a return to work for a time. Should the miracle happen, they can attribute it to whom and what they please

What are the symptoms likely to develop if nothing is done? These we find are just those which give the most unpleasant features to carcinoma of the rectum, they are due to the spread of the disease to neighbouring parts We have mentioned the constant aching pain of ulceration When this extends backwards to the sacrum and outwards to the sacral nerves, it is greatly aggravated, shoots down the back of the thighs, and becomes almost intolerable; large doses of sedatives are required to control it Even more misery is caused by extension forwards in the male to the prostate and bladder, causing genito-urinary distress, in the female to the vagina and uterus When genito urinary symptoms are added to the patient's misery, he has no peace, and life becomes unbearable.

Radium will materially cut down the blood-supply of the tumour According to B D Pullinger and other workers, restriction of the blood-supply is one of the chief modes of action of radium Owing to its action in stopping the mitosis of cells, the growth of the tumour will cease for a time, and fibrous tissue will form Under its influence the tumour will become less vascular, smaller, and more fibrotic, and shrinkage will continue for some time The application of radium is then repeated How far this shrinkage will continue depends on the dose, its accuracy, and the number of applications. A good deal of this depends again on the coöperation of the patient Before the dosage of radium was as well understood as it is today grave disadvantages might follow its use

A friend of mine was treated by radium alone, which was inserted interstitially between the bowel and the sacrum in a large and concentrated dose, and the radium was inadequately protected The result was that the bowel sloughed, the bone necrosed, and there was a constant leakage of bowel contents over a most sensitive sloughing area which had no chance of healing. He died worn out with pain the result of his treatment rather than from the disease from which he suffered.

This was not a rare phenomenon in the early days, when knowledge only advanced by the slow process of trial and error It was these results and similar ones in other parts of the body which gave radium the bad name from which it is only now recovering Now there is no contra-indication to radium given in the right dose adequately protected Nothing but good can come from its use.

The treatment, now more or less stereotyped after a long experience of trial and error, is as follows:—

Well-screened and protected radium 20–30 mg. is mounted on four strands of twisted copper wire, gauge 23, which is stiff enough for manipulative purposes and yet perfectly flexible This is inserted into the anus and guided by the finger or through a sigmoidoscope into the stricture, and the end is coiled up and fixed to the buttock with strapping; it is left in place for twelve hours It is then removed and inserted for twelve hours into the lower opening of the colostomy, a specially narrow sigmoidoscope being used to place it into position. The importance of having the colostomy opening as near the tumour as possible now becomes apparent. The coiled end of the wire is fastened to the anterior abdominal wall with strapping, one or two days' interval is allowed, and the procedure is repeated at both the anus and the colostomy opening. In the female an additional port of entry for growths low down is obtained through the vagina, the bladder being packed forwards.

In this way a dose of 1000–2500 mg hours is given to the tumour, which is ample to begin with. Experience alone enables one to estimate the dose according

to the size of the tumour This is repeated in fourteen days and again in a month's time Very shortly a considerable change will be noted in the tumour, a two months' interval is allowed and then longer and longer intervals are arranged, according to the reaction desired and obtained

In many cases the growth will shrink in an extraordinary manner, and in some cases it has disappeared from the interior of the bowel, all discharge and bleeding having stopped and all pain having passed off In one or two cases—e g , cases 1 and 6—nothing can be felt except a stricture where the growth previously existed This local action is all that can be expected, though the patient may foster hopes of a cure, hopes which are rightly encouraged by the relations and the doctor, but, if extension has already taken place to the glands, or if there are metastases already in the liver, these must take their course At the same time the patient will be spared the really disagreeable features of the disease Later, radium applications are required only if there is any return of local activity, as shown by a return or increase in the discharge, the bleeding, or the pain Most of the painful aspects of the disease are thus eliminated If, however, pain becomes a feature and cannot be controlled by sedatives, a few doses of deep X ray therapy should be tried—the kind of treatment does not seem to be of importance This sometimes has a considerable effect in diminishing the pain , more than this cannot be expected in these advanced cases

The end of carcinoma of the rectum which pursues its way unchecked is a mournful and sad affair and sedatives are needed in increasing quantities , but if the local extension can be checked the disease does not assume the same terrible and repulsive aspects Death from internal metastases in the liver and elsewhere is not a long nor a very unpleasant process

The following cases illustrate most of the points mentioned, and the results are considered highly satisfactory

CASE RECORDS

CASE 1 —A woman, aged 59, had been ailing more than a year, with spasms in the abdomen, loss of weight, and the passage of mucus and blood, and had been treated with vaccines for colitis In the last three weeks she had had wind, gurgling and violent spasms On examination she was anæmic and appeared toxæmic with visible peristalsis and a tense tumour felt in the left iliac fossa Sigmoidoscopy revealed nothing Radiography showed a stricture in the pelvic colon

At laparotomy on June 8 1933, were found a large tumour in the pelvis adherent to the wall and irremovable, a few glands close by and a nodule of uncertain nature in the liver Colostomy was performed Radium was applied twice during convalescence, and four times during the next eighteen months The patient gained weight steadily and was restored to health From 1936 to 1939 she had four more applications in smaller doses The colostomy opening had to be enlarged but otherwise gives no trouble The growth has shrunk to a tight hard stricture The patient is 2 st heavier than she was when first seen five and a half years ago

CASE 2 —A man, aged 62, was first seen on Oct 21, 1933, with a six months history of bowel upset, with the passage of two to four motions a day, containing mucus and sometimes a tinge of blood He had lost 2 st during the last year Colic and rumblings had increased of late, and there was severe constant aching pain Radiography suggested a bony tumour low down in the pelvis On examination he was pale, anxious looking, and stout, with a distended abdomen Per rectum a growth was felt with the finger tip

Laparotomy in the Royal Masonic Hospital revealed a fixed inoperable mass with extensive spread and large glands. Colostomy was performed Radium was applied during convalescence Subsequently radium was applied twice, with a gradual cessation of symptoms The patient gradually failed and died in November, 1934

CASE 3 —A woman, aged 60 was seen on April 10, 1930, with definite symptoms for more than two years with constant pain and loss of weight, but her illness had not been diagnosed On examination she was still a stout person Per rectum a large cauliflower-like growth was found, occupying the lumen of a distended rectum, well within the reach of the finger

Laparotomy showed that the growth was fixed to the floor of the pelvis, and masses of glands were felt over the common iliac vessels Nothing was felt in the liver Colostomy was performed Radium was applied through the vagina, the anus, and the colostomy In two months the growth became much smaller and her general condition improved immensely In the next eighteen months she had three more applications of radium, her growth shrivelled to insignificance her symptoms ameliorated, and she was fairly comfortable A turn then came, and she went downhill rapidly and died in February, 1932.

CASE 4 —A woman, aged 75, seen on Jan 4, 1933, had suffered from wind for six months She used to be very active but was now no longer so She always took aperients, had noticed mucus and even blood in her stools, and thought she had piles She had lost a little weight On examination she was thin, anæmic, and appeared toxæmic A thick rigid colon was felt on the left side, the cæcum was distended, and peristalsis was active Nothing abnormal was felt per rectum Sigmoidoscopy showed a fungating stricture about 8 in from the anus Obstruction seemed imminent

Laparotomy revealed dense adhesions round the mass, hard glands, liver free, colon packed with fæces Colostomy was performed Nothing could be obtained from the colostomy opening but a few hard masses in spite of all treatment On the 12th vomiting and urgent symptoms started The patient was washed out and "quarried" out with the handle of a dessert-spoon two or three times a day, a little being brought away each time, and oil enemas were given She was acutely ill, but it was not until the 21th that the last solid masses were cleared away, the bowel could be washed free and the abdomen at last became flaccid The vomiting and colic then stopped During convalescence radium was given through the vagina the anus, and the colostomy, and thereafter repeated at intervals Her health improved, and during the year she became more energetic and attended social functions, such as Ascot and the opera The growth discharged very little and gave her little trouble, but after eighteen months her appetite failed, and she went downhill rapidly, dying in May, 1934

CASE 5 —A man, aged 65 seen on April 24, 1933, said that his bowels had been regular until two months ago when they became frequent and no longer felt as if they emptied Mucus and blood had been noted lately with griping pains and loss of weight On examination nothing abnormal was found in the abdomen Per rectum a stricture was felt about 3 in from the anus, ulcerated at one side

At laparotomy in the Royal Masonic Hospital the condition was thought to be operable no glands were felt and there was nothing abnormal in his liver He then ran a temperature and developed lung trouble and the radiologist reported a metastasis in the right lung, but both Dr Chas Box and I thought it was inflammatory, and later it cleared up Nevertheless this made us think that radical operation was inadvisable Radium was given and he gradually

improved in health, gained weight, and returned to his work as a salesman He was in hospital for week-ends four times in 1934 and had radium He remained in fair health until the end, when he developed generalised carcinoma and required morphine. He died on Oct 9, 1935

CASE 6.—A man, aged 59, seen on May 9, 1935, said that a few months ago he had had severe pain in the lower part of the abdomen, vomiting, and a temperature. This passed off, but the bowels had never been normal since, and he always had wind and colic. Mucus and blood had not been noticed, but he had lost much weight. Radiography after a barium enema showed a stricture in the lower part of the pelvic colon.

Laparotomy was performed in the Royal Masonic Hospital. The pelvis contained a growth attached to the anterior wall, enlarged and hard glands were found in the mesentery, and nothing abnormal in the liver. The condition was inoperable. Colostomy was performed and radium given. In 1936 he had radium three times, and by the middle of the year he had returned to work in the coal trade and was motoring 600 miles a week. In 1937 an obvious stricture in the bowel seen through the sigmoidoscope was all the evidence remaining; he was 3 st. heavier than when first seen In 1938 he had two applications of radium, the last in December He is still at work and looks and feels well. The colostomy "gives no trouble to him, so long as he takes trouble with it."

CASE 7.—A man, aged 58, seen on Dec. 19, 1933, had had typical symptoms for some months and was diagnosed as cancer of the rectum before I saw him. Laparotomy in the Royal Masonic Hospital showed that the condition was inoperable, and radium was given. During 1934 he had three more applications of radium, his health improved, and he returned to work in March of that year. He remained well until the end of 1937, when he developed generalised carcinoma. He died in the early part of 1938

CASE 8.—A woman, aged 64, was admitted to St. Mary's Hospital in February, 1934 She could not say when symptoms started. There had been frequency of bowels and passage of mucus and blood. The patient had been losing weight On examination per rectum a growth was found well within reach of the finger.

Laparotomy revealed a fixed growth adherent to the neighbouring structures. Nothing abnormal was felt in the liver. A colostomy was performed and radium applied Later, radium was given on five separate occasions. In March, 1939, the patient felt and looked well and did her own housework unaided. A shrivelled growth could still be felt, but the mucous membrane over it appeared healthy. Sometimes there was a slight discharge but otherwise there were no symptoms. The patient is still well and says that her colostomy never bothers her.

SUMMARY

(1) The symptoms of inoperable carcinoma of the rectum are (*a*) frequency of defæcation, with the passage of mucus and, occasionally, blood; (*b*) pain, which consists both of spasmodic severe colic, associated with increasing rumblings and gurglings, especially in scirrhous carcinoma, and of a dull constant aching, due partly to ulceration and partly to extension to adjacent structures, especially nerves; (*c*) loss of weight, (*d*) anæmia, (*e*) toxæmia, and (*f*) anorexia

(2) Diagnosis is easy and can usually be made by digital rectal examination If not, sigmoidoscopy, or else radiography after a barium enema, may be necessary

(3) Treatment is more difficult Operation should not be urged if the patient is over 65, or if there is loss of weight, anæmia, or toxæmia If the cardiovascular system is not good, or if there is diabetes or renal disease, the case is inoperable If there is doubt about the inoperability, laparotomy should be performed to enable the growth to be examined. If the growth then proves to be irremovable, a left colostomy should be made If laparotomy is not necessary to confirm inoperability, the patient should be left to decide whether to have a colostomy or not, after having a full explanation from the surgeon In cases in which even a colostomy seems to be contra-indicated palliation of symptoms and prolongation of life can be aided by the application of radium

TREATMENT OF EPILEPSY WITH SODIUM DIPHENYL HYDANTOINATE

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LAST year Merritt and Putnam (1938) reported favourably on a trial of sodium diphenyl hydantoinate in epilepsy In their series toxic symptoms were seen *in 15 per cent. of cases, though they were mainly* transient and without danger. The reports that have since appeared have shown this substance, although of great benefit in epilepsy, to be more toxic than other established and efficacious drugs, whose toxicity in therapeutic doses is of little moment To justify its use in treating epilepsy it would therefore have to produce a much greater anticonvulsant effect than the other drugs, and would have to succeed where other therapeutic methods had failed For this reason it was decided to carry out a therapeutic trial on a selected group of epileptic patients who had been closely followed for many years, and whose condition had not been greatly influenced by other forms of treatment

MATERIAL

The ninety-one subjects of this inquiry were patients attending the National Hospital, Queen Square They all lived a fairly normal existence at home, many earning their living and others being dependent on their relatives. They therefore represented the type of epileptic patient met in the general population, and the conditions under which they were treated more closely approached those found in private practice than in institutions. The results of treatment are so far inconclusive in eight patients, so that eighty-three are included in the report

These patients had been observed regularly in the National Hospital for periods ranging from 6 months to 31 years with an average of 6·4 years, thirty-eight had been admitted to the hospital for investigation and stabilisation of treatment, and since discharge all but eleven of these had been observed regularly as outpatients An exact record of the course of the disease and of its response to alterations in treatment over many years was thus available in all cases As far as possible patients were selected for the trial whose epilepsy had progressed steadily in severity in spite of carefully controlled treatment. In all cases the response to the previous treatment was proving unsatisfactory when treatment with sodium diphenyl hydantoinate was begun The patients' ages ranged from 9 to 59 years, and epileptic fits had been present for 1 to 45 years, the average length of history being 14 years I am indebted to the physicians under whose care they were for permission to investigate the cases and for their coöperation.

In many patients fits had been observed in hospital, in others the history was conclusive, and in a few

whose accounts were inconclusive the diagnosis was made by electro encephalography The incidence of the different types of epilepsy was as follows —

Type of fit	*Patients*
Grand mal	72
Petit mal	35
Psychomotor	11
Grand mal and petit mal	28
Grand mal and psychomotor	7

As would be expected in such a series every orthodox form of treatment had been used After investigations, including encephalography and ventriculography, craniotomy had been performed in a few cases In some, ketogenic diets, water and salt elimination, snake venom and other methods of treatment had been used with varying success, but in all cases, before sodium diphenyl hydantoinate was used, various combinations of phenobarbital and allied barbiturates, with mixtures containing bromides, borax and belladonna, had been given a long trial The most usual dosage was gr 2–3 of phenobarbital with gr 30–40 of bromide and gr 20–30 of borax daily, but some patients received far larger doses than these

DOSAGE AND RESULTS

The longest continuous period of treatment with sodium diphenyl hydantoinate was 10 months, the shortest 6 weeks, the average duration in eighty three cases being 4 1 months Epanutin (P.D & Co) or sodium diphenyl hydantoinate (B D H) was given in capsules of 0 1 gramme An initial daily dose of 0 2 g or 0 3 g was slowly increased, and 0 6 g daily was given in some cases Phenobarbital and bromides were continued in decreasing doses during the period of substitution, and, as will be shown later, it was sometimes necessary to reduce the dose of sodium diphenyl hydantoinate and to supplement it with other anticonvulsants After trial of the drug alone the following combinations were found to give an optimum therapeutic effect

	Cases
Sodium diphenyl hydantoinate alone	52
with phenobarbital	9
with bromides	16
with phenobarbital and bromides	6

The results of treatment over an average period of 4 1 months are shown in the table which follows It is probable that some of the cases in the "relieved" group will later fall into the "improved" group, and that in time some of the beneficial effect of the drug will be lost, for experience with other anticonvulsants in this series has shown that even a trivial alteration in treatment may cause many months' remission in the fits

EFFECT OF SODIUM DIPHENYL HYDANTOINATE ON THE INCIDENCE OF DIFFERENT TYPES OF EPILEPSY

Result	Grand mal	Petit mal	Psycho motor	Mixed
	Number and percentage			
Relieved	15 (20 8)	6 (17 1)	1 (9 1)	4 (14 3)
Improved	42 (58 3)	16 (45 7)	4 (36 4)	17 (60 7)
Unchanged	10 (13 3)	9 (25 7)	4 (36 4)	5 (17 8)
Worse	5 (6 5)	4 (11 4)	0 (0)	2 (7 1)
Total	72 (100)	35 (100)	11 (100)	28 (100)

Grouping together those cases which were improved, it is seen that 79 1 per cent of subjects with grand mal and 62 8 per cent with petit mal were benefited In assessing this extremely good result it must be remembered that although the cases were of long standing and the fits had progressed in severity in spite of continuous treatment, the comparison was made between a newly exhibited drug and others which had been taken for months or years It is probable that if the initial effects of treatment with bromides and phenobarbital could have been compared the contrast would not have been nearly so striking, for some of the case histories show similar remissions when other forms of treatment were first begun

A group of cases showed a dramatic and maintained improvement with sodium diphenyl hydantoinate A detailed report of one of these has already been published (Williams 1939) This patient had had fits every day since infancy, but has been almost normal since beginning treatment with the drug 10 months ago ' Fifteen such subjects (18 per cent) have been selected from the series in view of the long history of frequent and unremitting grand mal and petit mal epilepsy which was cut short with sodium diphenyl hydantoinate In these fifteen there had been many fits each day for from 8 to 45 years (average 19 8 years) and complete or relative freedom has now been produced for an average of 5 months None of these patients had had such a remission before

In some cases no improvement was found with 0 2 or 0 3 g daily, but the addition of 0·1 g caused great improvement It was later found that the addition of 0 1 g above the therapeutic dose gave toxic symptoms, or that in time continuation of an effective dose of 0 4 g or more daily produced varying degrees of toxicity No patient receiving 0 5 g or more daily was free from toxic symptoms This suggested that the margin of safety between an adequate therapeutic dose and the minimal toxic dose in these cases was 0 1 g or less This observation was so repeatedly made in the present series that it seemed that the anticonvulsant effect might well be the presenting sign of toxicity in subjects receiving more than 0 3 g daily

In eight cases it was noticed by the patients or their relatives that although the fits had been greatly diminished in frequency since beginning the new treatment they had increased in intensity or had changed in character Some of these patients were so distressed at the severity of the fits that they preferred to have their former more frequent but milder attacks and asked to have their previous treatment replaced In subjects whose attacks had been greatly reduced in frequency many weeks of complete freedom were sometimes broken by isolated episodes when there were several severe attacks within a few hours One of these patients died in status epilepticus while receiving 0 5 g daily It seems that the drug raises the convulsive threshold but has little depressant effect on fits which have managed to cross that threshold An account of two patients who died in status will illustrate this effect

CASE 1 — A woman aged 30 had attended the hospital regularly for 10 years and had had major and minor fits for 7 years before that There were no gross physical abnormalities her general health had been good and her family history uneventful Before treatment she had had major fits on the average about once a fortnight but occasionally as many as four a day There were many minor attacks each day The major fits were well controlled and the minor were reduced to ten to twenty a month with phenobarbital gr 1 and sodium bromide gr 10 t d s This improvement continued for 2 years but the fits then increased again and when treatment with hydantoinate was started she was having fifty to sixty minor attacks with occasional major fits

each month, in spite of receiving phenobarbital gr. 4, sodium bromide gr 60 and borax gr. 30 daily. For a week 0 1 g. of sodium diphenyl hydantoinate was given with phenobarbital gr ¼ and sodium bromide gr. 10 three times a day. The next week 0 4 g of the hydantoinate and gr 1¼ of phenobarbital were given daily. The minor attacks fell to three a week. A week after beginning treatment the patient complained of itching, and a generalised morbilliform rash with petechiæ appeared in the flexures and on the palms. There were no other toxic signs, the tongue was clean, there was no adenitis, and the temperature, blood-count and urine were normal. The rash faded in 6 days with some desquamation and brown pigmentation in the flexures, and the patient felt well.

Treatment was continued unchanged for 3 weeks and the dose was then slowly increased to 0·6 g with sodium bromide gr 30 daily With this dose the attacks ceased completely Further toxic symptoms arose 7 weeks after treatment with sodium diphenyl hydantoinate had been begun. There was nausea, vomiting and anorexia for 4 days. The patient felt giddy and light-headed and complained of tremor, an unsteady gait and double vision. On examination the skin, tongue and mucosæ were normal. The patient was pale and looked ill She had ataxia, rombergism, fine nystagmus in all directions, a fine terminal tremor of the fingers and coarse bilateral intention tremor. The deep reflexes were equal and very brisk, the abdominals present and the plantars flexor. There were no other physical abnormalities and the blood-count and urine were normal.

The drug was discontinued for 3 days and a reduced dose of 0·5 g daily was then given All the symptoms and signs disappeared in 4 days. The patient felt well and was free from fits for 5 weeks on this dose, when she had five major fits in one day. She went into status epilepticus 2 days later and was admitted to hospital She continued to have major convulsions every 10–20 min in spite of paraldehyde, phenobarbital, magnesium sulphate and morphia. She died in coma the next morning, the fits having continued without interruption No gross lesions were found at autopsy.

CASE 2.—A woman aged 27 had had between seventy and a hundred grand-mal fits a year without remissions for 12 years. She had received continuous treatment at the hospital Hydantoinate was given for 9 months and the fits ceased, except for three outbursts in each of which nine to twelve fits occurred within a week. She had had no fits at all for 2 months while receiving 0 4 g of hydantoinate and gr. 30 of sodium bromide a day. She then entered status epilepticus, was admitted to hospital and died in two days, with a terminal bronchopneumonia

THERAPEUTIC EFFECT AND TOXIC SYMPTOMS

It was usual for patients to say that they felt less sleepy, that they were more active and that they had a sense of well-being which was absent with large doses of bromides and phenobarbital Bromide acne cleared up rapidly and the general demeanour of many of the patients suggested greater awareness and alertness On the other hand, relatives complained of truculence and aggression, and during observation in hospital behaviour disturbances occurred which may have been due to removal of the sedative action of the barbiturates, but which might also be attributed to a toxic effect of sodium diphenyl hydantoinate

The drug caused symptoms and signs of toxicity in 36 per cent. of the eighty-three cases The toxic effects closely resembled those described by Merritt and Putnam Sixteen patients (19 per cent.) developed early symptoms 4–10 days after beginning treatment; these were transient and slight and were produced by relatively small doses There was generalised pruritus, increased by warmth, with skin eruptions ranging from a slight erythema to a severe generalised macular eruption with petechial hæmorrhages leading in 4–6 days to a branny desquamation with faint brown staining A mild pyrexia reaching 99 8° to 100 2° F accompanied the rashes in two inpatients who were more closely observed than the outpatients, and throbbing bifrontal headaches, anorexia and slight nausea were also noticed at this stage These symptoms were observed separately in different patients They were unassociated with any other physical abnormalities, and blood and urinary examinations were normal

Late symptoms were associated with larger doses (0 4–0 6 g daily) and arose 6–12 weeks after beginning treatment They usually followed closely on an increase in dosage They were as follows.—

Alimentary.—Anorexia with lethargy, continuous nausea, epigastric discomfort, vomiting after food, furred tongue and constipation These symptoms have been attributed to the alkalinity of the drug and are said to be minimised by giving it after meals No changes like those described by Kimball (1939) were found in the gums

Nervous.—The following symptoms were met with Bifrontal headaches, pallor, lethargy, bilateral ptosis, blurring of vision, diplopia, ataxia and fine tremor of the fingers with incoördination in the hands Abnormal signs were fine nystagmus in all directions, terminal finger tremors, slight incoördination, gross ataxia, with rombergism and extremely brisk tendon jerks These symptoms disappeared in all cases within 3 days of stopping treatment and did not recur when treatment was recommenced with the dose reduced by 0 1 g daily.

Mental.—Irritability with sullen restlessness, leading to unprovoked aggression, was reported by relatives of outpatients and observed in three patients in hospital The following is an account of one of these cases:—

CASE 3.—A man of 24 had had grand mal fits for 10 years He often had several in one day, but there were remissions of several months from time to time He was admitted to hospital in status epilepticus and in spite of large doses of phenobarbital and magnesium sulphate he had 30 and 40 grand mal attacks on successive days. He was then given 0 3 g. and later 0 5 g. of hydantoinate and gr. 3 of phenobarbital daily. The fits fell from 40 to less than 1 a day After a few days he became irrational, truculent and aggressive to the nursing staff and patients. The hydantoinate was replaced by gr 30 of sodium bromide after 13 days and in a day the patient became quiet, cooperative, and friendly with the other patients and staff He seemed mentally normal, but had many more fits After 12 days 0 5 g. of hydantoinate was again used instead of bromides The fits ceased, but he became abusive and difficult and made an unprovoked attack on another patient. Hydantoinate was therefore discontinued and he became mentally normal again

Cardiac.—Three patients who had no history of cardiac or renal disease developed changes in cardiac rate during the time that other toxic signs were present.

One patient, aged 20, had a simple bradycardia of 52 per min 3 months after beginning treatment Another, aged 58, had a bradycardia of 14 per min. with very frequent ventricular extrasystoles 5 weeks after starting treatment with hydantoinate. The patient complained of weakness, breathlessness, and swelling of the ankles, and showed cardiac dilatation, inversion of the T wave, and clinical signs of cardiac insufficiency. The blood-counts and urinary examinations of these patients showed no abnormality. They recovered rapidly when the dose was reduced and a week later their pulse-rates were 80 and 72 respectively. There were then no other toxic symptoms.

The third patient, aged 34, had his first attack of paroxysmal tachycardia on the way to hospital, two months after beginning treatment When seen the apex was in the anterior axillary line, and the heart rate was 180 In this case the attack of paroxysmal tachycardia may merely have been coincidental.

DISCUSSION

Except for the greater frequency and variety of toxic symptoms encountered, the results of this trial are similar to those reported by Merritt and Putnam The subjects had all ceased to respond to routine treatment with anticonvulsants and the results in some cases show that the drug may be of great value when other anticonvulsants have failed The less encouraging results in other cases, and especially in the 30 per cent in whom the drug caused toxic symptoms, indicate that it should not replace the more reliable but less spectacular anti convulsants at the beginning of treatment The impression gained during the trial was that in the treatment of epilepsy, after all investigations have been undertaken to exclude a remediable cause, the well established anticonvulsants—bromide, borax, belladonna and barbiturates (phenobarbital)—should first be used If these fail, treatment with sodium diphenyl hydantoinate may be of benefit If relief is not obtained with doses of less than 0 5 g daily it will probably be wise in most cases to discontinue the drug or to supplement it with other anticonvulsants, for in very resistant cases more satisfactory therapeutic results were obtained with fewer toxic effects by supplementary treatment with phenobarbital or bromides Although the toxic symptoms do not seem to be dangerous, the small difference between the therapeutic and toxic doses calls for careful administration

It is interesting to compare the pharmacological actions of sodium diphenyl hydantoinate with those of the other anticonvulsants It has been shown that with sodium diphenyl hydantoinate a great reduction in the number of fits is sometimes accompanied by isolated outbursts of severe attacks The optimum therapeutic dose closely approaches the toxic, and fits do not occur at all when toxic symptoms are present It seems, in fact, that the anticonvulsant effect is a close precursor of the toxic in some cases Further, the drug has little or no depressant action on the nervous system These observations suggest a completely different anticonvulsant effect from the bromides or barbiturates, for these substances seem to control epilepsy in virtue of their depressant action on the central nervous system

It may be that whereas the bromides modify the response of the nervous system to the factor initiating a convulsion the hydantoinate suppresses this cause without modifying nervous activity If so the hydantoinate would be producing its effect at an earlier stage in the epileptic process When the cause of the convulsions reaches dimensions too great to be controlled by hydantoinate, however, it seems to activate a completely undepressed nervous system, and so causes a maximal response

SUMMARY

Ninety one chronic epileptics who had ceased to respond to other anticonvulsants were treated with sodium diphenyl hydantoinate The patients all lived at home and had been under regular observation and treatment with other drugs for an average of 6 4 years The trial period ranged from 6 weeks to 10 months (average 4 1 months)

The fits were reduced in frequency in 79 per cent of the subjects with grand mal and 63 per cent of those with petit mal In 10 per cent the improvement was dramatic and has been maintained for over 5 months Toxic symptoms arose in 36 per cent and two patients died in status epilepticus while receiving the drug

The drug seems to be of value in the treatment of epilepsy in some cases when other forms of treatment have failed, but there are no indications that it should supersede the less toxic anticonvulsants in the initial stages of treatment Its administration requires careful observation of the patient

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CHEMOTHERAPY OF EXPERIMENTAL ANTHRAX INFECTION

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THE relative values of the various therapeutic agents, or surgical procedures, which have been used in the treatment of human anthrax infection are difficult to estimate since the conditions essential to satisfactory clinical trial are almost impossible to fulfil The case mortality in Great Britain from all forms of anthrax varied during the five year periods between 1901 and 1930 from 10 5 to 29 6 per cent Respiratory and alimentary anthrax are almost invariably fatal, while the mortality of the cutaneous form may vary from 3 3 to 24 3 per cent (Legge 1934) according to the site of infection The standard treatment in the past, apart from surgery, has consisted in the use of immune serum and arsenicals There appears to be a consensus of opinion that each of these reagents has a therapeutic effect but the results are greatly influenced by the site of infection and the stage at which treatment is begun

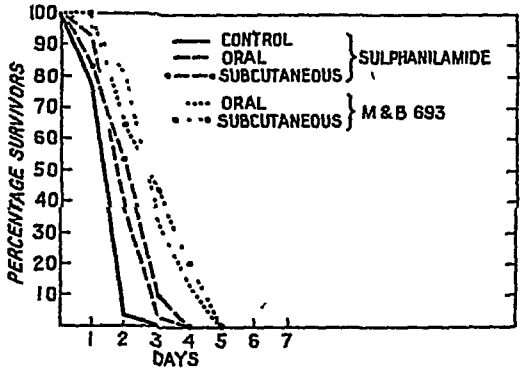
Sclavo (1903) reported that the mortality of a series of 164 cases in man treated with immune serum was 6 09 per cent in contrast to the general anthrax mortality of 24 1 per cent for all Italy during the same period, a comparison not free from possible criticism since other differential factors may have been present Eurich (1933) uses both serum and Salvarsan in cutaneous anthrax and records a mortality of 5 per cent in 200 cases but states that the relative value of the two substances is uncertain Gilbert (1935), Spencer (1934) and many others report a high proportion of recoveries in cases treated with neoarsphenamine or other arsenicals In the report (1935) on industrial anthrax of a committee of the American Public Health Association, in which various treatments are reviewed, it is concluded that the treatment of choice is immune serum, in default of which neoarsphenamine should be used, although it is again stated that the value of immune serum is not completely proved and that some deny its specificity Other treatments which have been used are injections of peptone, of acriflavine and of copper sulphate though there is no sound evidence that they are effective

The success that has been achieved in the treatment of various bacterial infections with various sulphanilamide compounds clearly justifies their trial in anthrax infections, and such trials have probably

TABLE I—TREATED AND UNTREATED MICE SURVIVING AT SUCCESSIVE DAYS AFTER INFECTION

	Day					
	0	1	2	3	4	5
Control (untreated)	30	23	1	0	0	0
Sulphanilamide (oral)	30	28	11	1	0	0
Sulphanilamide (subcut.)	30	25	16	3	0	0
M & B 693 (oral)	30	29	24	10	4	0
M. & B. 693 (subcut.)	30	30	19	13	6	0

FIG 1



been made during recent years. I have not, however, been able to trace any published clinical records; and it is, in any case, desirable to assess the value of these drugs in experimental infections and under controlled conditions

EXPERIMENTAL TECHNIQUE

The general plan of the experiments recorded in this paper was as follows.

The strain of *B. anthracis* used was obtained from *the Ministry of Health laboratories through the* courtesy of Dr W M Scott. It had been isolated from horse-hair and was typical in its cultural and biochemical reactions It was tested for virulence by the inoculation of 0 25 c cm of decimal dilutions in saline of a 24-hour serum broth culture subcutaneously in the left thigh of groups of mice The larger doses killed all the mice in 24–28 hours and the dilutions chosen for the tests were of the order of 10^{-3} or 10^{-4} which killed the mice usually in 2–5 days The inoculum of 0 25 c cm of the 10^{-4} dilution was found on plating to represent about 150 viable organisms. The infected mice developed a large inflammatory local lesion with œdema spreading up the flank and abdominal wall The organism could be recovered in large numbers from the local lesion, spleen and heart-blood

The mice weighed 20–26 g and were of equal *resistance in all groups, having come from the same* stock and been fed on the same diet All groups consisted of 30 or more mice.

Treatment with the various drugs was begun half an hour after infection and was usually continued for ten days Cultures were made from the local lesion, spleen and heart-blood of the majority of the mice. The control mice invariably had intense *B anthracis* septicæmia

The object of the first experiment was to find out whether sulphanilamide or M & B 693 had any effect on the course of infection Sulphanilamide was chosen as representative of the original products found effective in streptococcal and meningococcal infections, and M. & B. 693 as an example of those active in pneumonia and certain other infections For oral administration the drugs were ground in a mortar and emulsified in water, then added to an equal volume of mucilage of tragacanth so that the required dose was contained in 0 5 c cm *This was* given directly into the stomach by means of a 1 c cm. syringe fitted with a blunt-ended No 19 needle For subcutaneous injection the sulphanilamide was given in solution sterilised by autoclaving and the M & B 693 in the suspension in olive oil issued in ampoules by the manufacturers

A total of 150 mice were infected with *B. anthracis* subcutaneously, and divided into five equal groups, of which one was kept as a control. The other groups received respectively throughout the experiment daily doses of 10 mg. of sulphanilamide by mouth; 10 mg. of sulphanilamide subcutaneously, 20 mg of M. & B. 693 by mouth; and 20 mg. of M. & B 693 subcutaneously The larger dose of M & B 693 was given on account of its lower toxicity for mice, the average lethal dose being about 16 6 mg per g. (Whitby 1938) as compared with 4 mg. per g. for *sulphanilamide (Marshall 1939) For the mice used* these toxic doses would be about 330–420 mg. and

FIG. 2

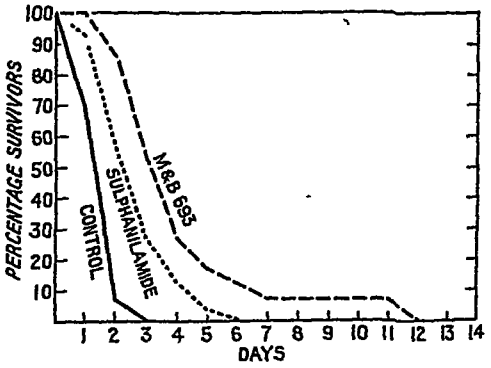


TABLE II—COMPARISON OF SURVIVAL TIMES WITH SULPHANILAMIDE AND M & B 693

		Mice	Mean survival time (days)	Standard error
A	Control	30	1 27	0 102
	Sulphanilamide	30	2 43	0 221
	M & B 693	30	3 80	0 443
B	Control	30	1 23	0 104
	Sulphanilamide	30	2 87	0 213
	M. & B 693	30	5 10	0 482

FIG 3

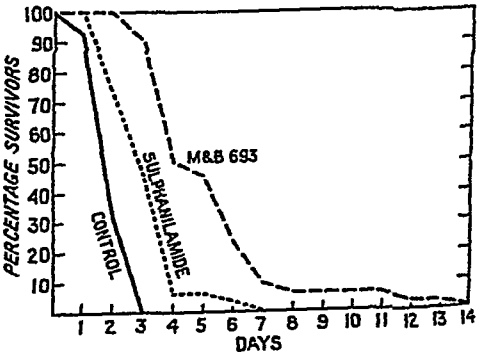


FIG 4

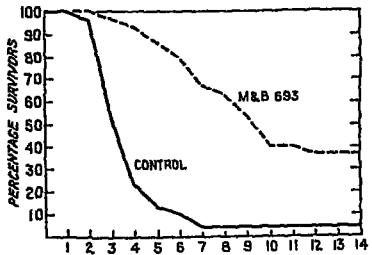
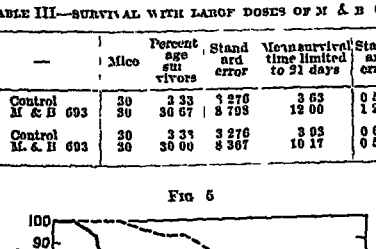


TABLE III—SURVIVAL WITH LARGE DOSES OF M & B 693

		Mice	Percentage survivors	Standard error	Mean survival time limited to 21 days	Standard error
A	Control	30	3 33	± 2 76	3 63	0 508
	M & B 693	30	30 67	± 8 798	12 00	1 228
B	Control	30	3 33	± 2 76	3 03	0 501
	M. & B 693	30	30 00	± 8 367	10 17	0 501

FIG 5



80–100 mg respectively In this and in subsequent experiments a group of 8–10 uninfected mice received the same doses of the drugs as the infected groups and were observed for a few weeks afterwards in order to ensure that the drugs themselves did not have any injurious action on the mice

The results are shown in table I and fig 1 None of the mice survived beyond the fourth day after infection, but life was definitely prolonged in all groups receiving treatment This is clearly shown by the figures recorded on the second day It may be inferred therefore from this experiment that both sulphanilamide and M & B 693 have some effect in delaying death from anthrax infection Further, there is no difference in the effect of oral and subcutaneous administration In the doses employed, M & B 693 is more effective than sulphanilamide

In the next experiment a 20 mg dose of sulphanilamide or M & B 693 was given by mouth twice daily as long as any mice survived so that a direct comparison of the two drugs was possible The same test was repeated and the results of the two experiments are recorded in table II (A and B) and in figs 2 and 3 Although there were still no survivors at the end of fourteen days the effect of treatment in delaying death is significant and it is also evident that M & B 693 is more effective than the same dose of sulphanilamide

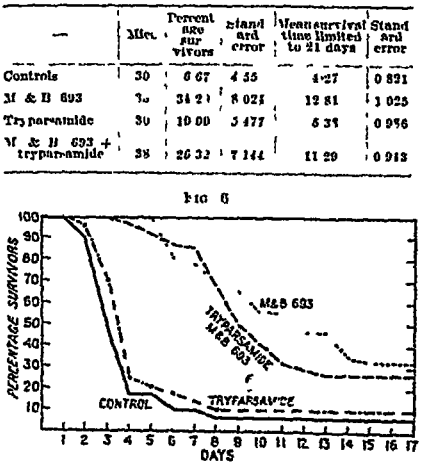
It was now desired to determine whether one could, by increasing the dose of M & B 693 to a very high level (100 mg daily), bring about a significant survival-rate in the treated group It was thought that the *concentration of* the drug in the blood might fall at some stage owing to the time elapsing between the night and morning oral doses It was therefore decided to give 60 mg by the oral route in two daily doses of 30 mg, and 40 mg daily by subcutaneous injection The oral treatment was continued for ten days and the subcutaneous injections for six days This experiment was also repeated with a slightly different infecting dose (table III A and B, figs 4 and 5) In each test there was 1 survivor amongst the controls (3 33 per cent) and there were 11 (36 67 per cent) and 9 (30 per cent) survivors in the treated groups These differences are clearly significant, as are also the differences in the mean times to death of the control and treated mice It may be stated that these large doses of M & B 693 did not appear to have any injurious effect on the mice, and there were no deaths in the uninfected group receiving the drug In a proportion of the treated mice dying after the seventh day it was not possible to isolate *B anthracis* from heart blood, spleen or site of infection, and in many of them there was no sign of any local lesion Œdema and redness at the site of infection were in fact rarely prominent in mice receiving M & B 693

Since it was established that the life of infected mice could be prolonged by moderate doses of M & B 693 and about a third of the infected mice could be saved by larger doses, it seemed of interest to try the effect of large doses of arsenical compounds which from their reported success in human anthrax might be expected to influence the experimental infection, though the published records of previous tests in the experimental disease were not encouraging (Cambouédès and Reilly 1925, Stolygyo 1927, Urbain, Theobalt and Vallée 1930, Kurotchkin and Reimann

TABLE IV—SURVIVAL WITH LARGE DOSES OF M & B 693, WITH TRYPARSAMIDE AND WITH BOTH TOGETHER

	Mice	Percentage survivors	Standard error	Mean survival time limited to 21 days	Standard error
Controls	30	6 67	4 55	4·27	0 821
M & B 693	30	34 21	± 8 021	12 81	1 025
Tryparsamide	30	10 00	5 477	6 33	0 956
M & B 693 + tryparsamide	38	26 32	± 7 144	11 29	0 913

FIG 6



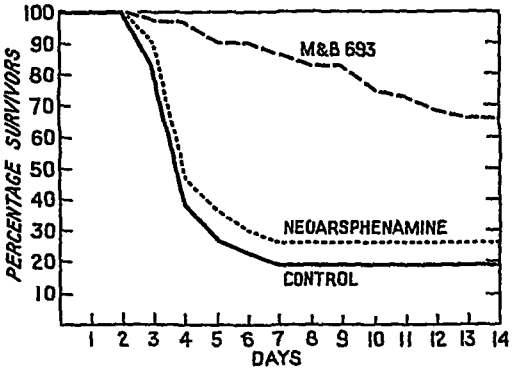
1930) Trial was first made of Tryparsamide (sodium N-phenyl glycineamide-*p*-arsonate). The maximum tolerated dose for a 20 g. mouse is given by Yorke, Murgatroyd and Hawking (1931) as 100 mg. It was determined that the mice used in the present trial would actually tolerate without ill effect the intraperitoneal injection of 20 mg in 0·5 c.cm. of sterile distilled water daily over a period of ten days. This dose was therefore employed.

In table IV and fig. 6 are shown the results of treating groups of mice for ten days with M. & B. 693 (50 mg. twice daily by mouth), with tryparsamide, and with both simultaneously. There were 6·67 per cent. of survivors in the control group, 31·43 per cent. in the group treated with M. & B. 693, 10 per cent. in those treated with tryparsamide and 26·32 per cent. in those receiving both drugs. One may deduce from these figures and those for the mean survival times that tryparsamide is without action and does not enhance the effect of M. & B. 693, which is evident in the two groups receiving it.

TABLE V—COMPARISON OF SURVIVAL WITH M. & B. 693 AND WITH NEOARSPHENAMINE

—	Mice	Percentage survivors	Standard error	Mean survival time limited to 21 days	Standard error
Controls	30	20·00	·7303	7·00	1·24
M. & B. 693	30	66·67	8·606	16·30	1·13
Neoarsphenamine	30	26·67	8·073	8·50	1·34

FIG. 7



Finally, a similar experiment was performed to determine the effect of neoarsphenamine (Neokharsivan, B. W. & Co.). This drug was shown to have an average lethal dose for 20 g. mice of about 5 mg. A dose of 1 mg. which was well tolerated by the mice was used in the test. It was given intraperitoneally in 1 c.cm. of sterile distilled water freshly boiled just before solution and injection of the drug. Another group of mice received M. & B. 693 by mouth in the same dosage as in the previous experiment. Treatment was continued for ten days. There were 30 mice in each group.

From the results which appear in table V and fig. 7, it will be noted that the mice received a rather smaller infecting dose than usual, and that 20 per cent. of the untreated mice survived. Of those treated with M. & B. 693, 66·67 per cent. survived, as compared with 26·67 per cent. of those treated with neoarsphenamine. It is thus clear that benefit has been conferred on the mice treated with M. & B. 693, and this is confirmed by the figures for the mean survival times. The effect of neoarsphenamine is entirely insignificant.

In all the foregoing experiments the mice were observed for twenty-one days, but deaths did not occur after the fifteenth day. In the last series the mice surviving on the twenty-first day, all healthy in appearance, were killed and cultures made on agar from the heart-blood and spleen. Half of the spleen was also taken into broth from which any growth after incubation was plated on agar. In no case was *B. anthracis* isolated from these mice.

DISCUSSION AND CONCLUSIONS

Of the agents tested only M. & B. 693 and sulphanilamide were found to have a beneficial action on the course of anthrax infection in mice, and of the two M. & B. 693 was more effective. The action of these drugs is not so dramatic as in streptococcal infection, but when very large doses of M. & B. 693 are given a considerable proportion of the mice survive and the curative effect is complete in the sense that the organism is not recoverable from the tissues of the mice. It is to be noted that the therapeutic doses are almost twice as large as those given by Schütze (1939) to mice in his study of plague infection. He found that a successful result was obtained by giving 80 mg. of M. & B. 693 along with the test dose and an estimated dose of 50 mg. daily which was taken with the food.

Since these mouse doses multiplied weight for weight would indicate an enormous dose of M. & B. 693 for man, the question arises as to whether any inference at all may be made from the experiments reported in regard to the use of the drug in human infections. It should, however, be noted that the experimental infection is far more severe than cutaneous anthrax in man. In all experiments but the last, all, or almost all, of the control mice died. In the last experiment, with a death-rate of 80 per cent. among the controls, the death-rate among the mice treated with M. & B. 693 was reduced to 33·3 per cent. The death-rate in cutaneous anthrax in man varies, as has been noted, between 3·3 per cent. and 24·3 per cent., and it seems at least possible that, with these milder infections, relatively smaller doses than those given in most of these experiments might have a considerable therapeutic effect. Moreover, it seems clear that M. & B. 693 has, in the mouse, a far more effective action than have arsenical compounds. Pending adequate clinical trials, it seems reasonable to conclude that the same may be true in human anthrax. Whether M. & B. 693 would exert any significant therapeutic effect in pulmonary anthrax is, of course, more doubtful, but in a disease which, untreated, appears to be uniformly fatal, it would clearly be justifiable to give unusually large doses.

Whether M. & B. 693 would enhance the effect of a specific antiserum, or how it would compare with such a serum as a therapeutic agent, are questions that must await both animal experiments and adequate trials in man.

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ACTION OF THE SULPHONAMIDES IN EXPERIMENTAL ANTHRAX

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ALTHOUGH drugs of the sulphonamide class have now been shown to be effective against a number of pathogenic bacteria besides *Streptococcus pyogenes*, no information is available as to their efficacy in anthrax infections This investigation was undertaken to find out whether there is any experimental evidence in favour of applying these drugs to human anthrax, how they compare in efficacy with commercial and other anti anthrax sera, and whether they exert any synergic action with anti serum as they do in infections due to the pneumococcus and *Str pyogenes*

TECHNIQUE

The strain of *B anthracis* used throughout was isolated from a vesicle in a case of cutaneous anthrax in an artificial manure worker It was passed repeatedly in mice until its virulence for this animal had become constant, at this stage a dose of approximately 30 bacilli injected intraperitoneally killed 90 per cent of the mice in 4 days Heart's blood was used for passage, the inoculations being made subcutaneously, throughout the investigation the strain was maintained in mice and not in artificial culture In this way its virulence for the mouse was kept more or less constant

Most investigators, such as Sterne (1937b) and Ivanovics (1937), have used fractions of an agar slope as an indication of dosage It was decided that this was too indefinite and that the approximate number of organisms used should be known Sterne (1937a) showed that capsulation of anthrax bacilli could be obtained on artificial media if the carbon dioxide concentration of the atmosphere in which it was incubated was raised to between 50 and 60 per cent This was confirmed using 14 per cent serum agar slopes and 5 per cent rabbit blood agar slopes However, it was found impossible to prevent spore formation under these conditions and it is well known that a proportion of relatively avirulent variants can be produced from a virulent strain even on first subculture on an artificial medium It was decided therefore to use the peritoneal exudate of a mouse dead overnight from intraperitoneal infection with anthrax A tenth of a 16 hour agar slope culture made from the passage strain was injected intraperitoneally and the peritoneal exudate washed out with 10 c cm of broth on the following morning The presence of a pure suspension of capsulated non-sporing anthrax bacilli was confirmed by microscopic examination Ten fold dilution of the exudate were prepared and 0 5 c cm of each dilution used with 10 c cm of agar as a poured plate for a viable count It was found that in the peritoneal exudate chains of bacilli very rarely occurred, usually the bacilli were single or in pairs and the viable counts for successive dilutions gave approximately ten fold diminution in colony counts

Sulphonamide P (B W & Co), M & B 693 and 4 4 diaminodiphenyl sulphone glucoside were used We are indebted to Dr G M Findlay for a supply of the last preparation Suspensions of the first two compounds were prepared in equal parts of water and *mucilage of tragacanth*, the sulphone was dissolved *in water*, all these were given by mouth except for one experiment in which M & B 693 was given subcutaneously as well as by mouth The doses of sulphonamide and M & B 693 were probably only accurate to ± 10 per cent owing to the difficulty of *obtaining a homogeneous stable suspension* The preparations were administered 4 hours before infection and thereafter at 24 hour intervals Sera were given intraperitoneally in a single dose of 0 5 c cm 4 hours before infection In each experiment twelve mice were treated with the drug and twelve untreated served as controls Six mice in each group were infected with approximately 300 organisms intraperitoneally in 0 5 c cm of broth and the other six received approximately 30 organisms in the same volume.

TABLE I—RESULTS WITH THREE SULPHONAMIDE DRUGS

Drug	Dose	Total dose	Infecting dose number of organisms	Treated mice † dead at end of—		Control mice † dead at end of—	
				2nd day	4th day	2nd day	4th day
Sulphonamide P (B W)	20 mg in each of 3 doses	60 mg	30 300	1 2	3 5	3 2	6 5
M & B 693	40 mg in each of 2 doses	80 mg	15 200	0 0	0 5	3 5	5 6
	60 mg by mouth, 3 doses * + 60 mg *	240 mg	20 280	0 1	5 6	3 6	6 6
Sulphone	20 mg, 2 doses	40 mg	35 400	0 2	4 4	2 3	6 6

* In olive oil subcutaneously one dose
† Each group consisted of six mice All mice died by 6th day

RESULTS

The results of experiments with the three drugs are given in Table I

The following sera were tested

(1) Sclavo's
(2) Mulford's
(3) Serum from a patient recovered from a natural infection with anthrax, *the serum being collected* three weeks after infection.
(4) A rabbit immune serum prepared by giving twelve weekly intravenous injections of the whole of a mouse peritoneal washing, sterilised with 0 5 per cent formalin and kept at 0° ± 1° C till sterile This was a fully capsulated bacterial vaccine This serum precipitated the "P" substance of the anthrax

TABLE II—PROTECTIVE ACTION OF VARIOUS ANTI ANTHRAX SERA

Serum	Infecting dose, number of organisms	Treated mice * dead on—		Control mice * dead on—	
		2nd day	4th day	2nd day	4th day
Sclavo's	15	3	6	5	6
	300	6	6	4	6
Mulford's	80	0	5	2	5
	400	6	6	5	6
Human convalescent	20	0	4	4	6
	350	2	5	4	6
Rabbit immune	20	0	2	5	6
	250	0	1	5	6

* Each group consisted of six mice.

capsule, a polymer of d(−) glutamic acid (Ivanovics and Bruckner 1938, to a titre of 1/1000. The sera were given in 0·5 c.cm. doses intraperitoneally 4 hours before infection. In the test of each serum twelve mice were treated while twelve untreated animals served as controls. The infecting doses were the same as in the experiments with the drugs. The findings in these experiments are recorded in table II.

The three remaining mice in the experiment with patient's serum and the nine remaining mice in the experiment with rabbit serum all survived.

Two experiments were carried out with a combination of M. & B. 693 and serum, 0·5 c.cm. of serum being given intraperitoneally 4 hours before infection and 40 mg. of M. & B. 693 by mouth in each of the doses, the first 4 hours before infection and the second 24 hours later. The results are summarised in table III.

TABLE III—COMBINED EFFECT OF DRUG AND SERUM

Serum	Infecting dose	Treated mice dead on—		Control mice dead on—	
		2nd day	4th day	2nd day	4th day
Human convalescent + M. & B. 693	30	0/3	1/3 *	2/3	3/3
	200	0/3	1/3 †	2/3	2/3
Immune rabbit serum + M. & B. 693	30	0/5	0/5	5/5	5/5
	250	0/5	4/5	5/5	5/5

* 2 more died on 5th day. † 1 died on 5th day.

DISCUSSION

Although there is no evidence from these experiments that any of the three chemotherapeutic preparations—sulphonamide, M. & B. 693, sulphone glucoside—had any effect, in the dosage employed, on the ultimate outcome of infection in mice with *B. anthracis*, there is some indication that the drugs were not entirely without effect. The findings at the end of 2 days showed fewer deaths among the treated mice than among the controls. And, although these differences were not sufficiently great to be significant in the case of the groups treated with sulphonamide and the sulphone, in the case of the mice treated with M. & B. 693 the differences appear to be significant. At the end of 2 days, in the first experiment with M. & B. 693, when eight out of twelve control mice were dead, all the twelve mice treated with M. & B. 693 were alive and apparently well. This suggests that M. & B. 693 had the effect of holding up temporarily the course of the infection.

With the two commercial sera most commonly used in this country there was no difference at any stage of the experiments between treated and control animals; similar findings have also been obtained by Tomcsik and Ivanovics (1938) with the sera commercially available in Hungary. The serum prepared in the rabbit, however, saved nine out of twelve mice. Since it has been show by Ivanovics (personal communication) that anti-anthrax sera capable of protecting mice may be ineffective in guineapigs and rabbits, it by no means follows that a serum conferring no protection on the mouse would be valueless in the treatment of human anthrax. Clinical experience has in fact shown (Eurich 1927, Hodgson 1928) that Sclavo's serum does exert a beneficial effect on anthrax infections in man.

The main object of these experiments with anti-anthrax sera in mice was to find out whether, with a serum protective for this animal, there is any synergic action between serum and drugs of the sulphonamide group such as has been shown for antipneumococcal sera and M. & B. 693 by Fleming (1938) and for anti-streptococcal serum and sulphanilamide by Loewenthal (1939). No such complementary action could be demonstrated, for the results obtained with the anti-anthrax rabbit serum together with M. & B. 693 were no better than with serum alone. Although there is no clear indication from this work that drugs of the sulphonamide group would be a useful adjunct to serum in the treatment of human anthrax, the fact that they, and M. & B. 693 in particular, were apparently able to hold up temporarily a rapidly invasive infection suggests that they might be of some service. Actually, while these experiments were being carried out, 2 cases of severe cutaneous anthrax were treated with M. & B. 693 and Sclavo's serum. Though both recovered, it cannot justifiably be claimed that the use of the drug played any material part in overcoming the infection.

SUMMARY

(1) M. & B. 693 and to a less extent sulphanilamide and sulphone delay death in mice infected with fully virulent capsulated non-sporing anthrax bacilli.

(2) No ultimate decrease in mortality is found by using these drugs.

(3) Two commercially available sera commonly used have no protective action for mice.

(4) The findings of Ivanovics and Bruckner, that an anti-anthrax serum prepared in the rabbit exerts a high degree of protection in mice, have been confirmed.

(5) There is no apparent increase in the protective action of serum in mice by using it in combination with M. & B. 693.

We are indebted to Prof. S. P. Bedson and Dr. P. N. Panton for help and encouragement, and to Dr. G. Ivanovics for supplying some purified "P" substance of the anthrax capsule.

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COMPLETE HEART-BLOCK IN YOUNG PEOPLE

REPORT OF TWO CASES

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CASES of complete heart-block in children and young people have been recorded by Archigène in 1927 (39 cases), Yater in 1929 (30 cases of congenital block); Wood and Rogers in 1932 (6 cases of congenital block); Sprague and White in 1927 (11 cases of juvenile block); Perry in 1931 (3 cases in children, 2 the result of rheumatic heart disease and 1 a sequel of an attack of diphtheria, all leading normal school lives); and Campbell and Suzman in 1934 (8 cases of congenital complete block, 7 living normal lives, 1 died of rheumatic complications). Lemann, in a review of the literature in 1933, stated that heart-block was congenital in 42 of the approximately 100 published cases.

The first case reported here was evidently the result of a severe measles infection. All the acquired

cases of persistent heart block in children due to infection are said to result from influenza, diphtheria, and rheumatic fever, this seems to be the first one reported as the result of measles The second case had severe measles at the age of three, and malignant influenza in 1918 at the age of five, so there was a source of infection which might have caused the heart block Otherwise, it must be considered as congenital A point of interest in this case is the high ventricular rate after exercise and injection of atropine gr 1/33 After exercise the ventricular rate increased from 50 to 80, the auricular rate from 90 to 100 After atropine the ventricular rate increased from 50 to 80, the auricular rate from 90 to 110

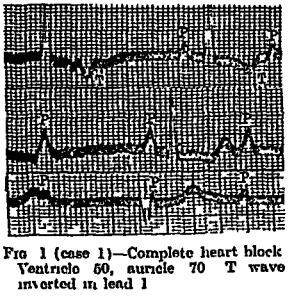

FIG 1 (case 1)—Complete heart block Ventricle 50, auricle 70 T wave inverted in lead 1

Liljestrand and Zander (1927) investigated a case, a young man of twenty one who was able to take part in strenuous games and to swim "for as long as he liked" His ventricular rate increased up to over 100 with strenuous exercise Aitken (1932) reported two cases after injection of atropine gr 1/75 In the first the ventricle increased from 62 to 94, and the auricle from 100 to 150 In the second the ventricle increased from 55 to 87, and the auricle from 100 to 137 Atropine has been shown to produce similar effects in other cases, but in some there has been no response at all

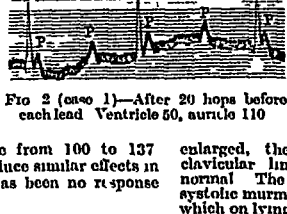

FIG 2 (case 1)—After 20 hops before each lead Ventricle 50, auricle 110

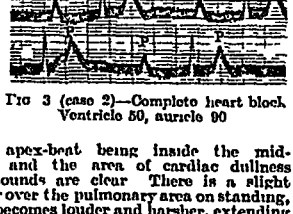

FIG 3 (case 2)—Complete heart block Ventricle 50, auricle 90

CASE 1.—A boy aged thirteen, with heart rate 56 per min At the age of three he had severe measles and is said to have nearly died His doctor noted a murmur over the heart He was kept very quiet for a long period and as he seemed well was allowed gradually to take more exercise By the time he went to his preparatory school he was able to play games and run without fatigue At the age of thirteen during an attack of influenza, the school doctor noted that there was a marked systolic murmur over the cardiac area

On examination he is a very active boy, thin and excitable, but looks healthy Heart-rate regular, 56 per min Apex-beat inside the midclavicular line, and area of cardiac dullness normal All the sounds are accentuated The first sound at the apex and the pulmonary second are more accentuated but clear There is a harsh systolic murmur best heard over the pulmonary area and audible down to the apex, both on standing and lying Blood-pressure 130/90 Radiography shows enlarged right auricle, beating 2 beats to 1 of the ventricle Exercise-tolerance 56 per min before exercise, 60 after 20 hops, and 56 after resting two minutes, response is good, with no dyspnœa (see figs 1 and 2)

CASE 2.—A youth aged nineteen, with heart rate 50 per min At the age of three he had severe measles, but was not dangerously ill In 1918 at the age of five he had severe influenza of the malignant type which was then prevalent In 1927 at the age of fourteen his doctor accepted him on the "club" In 1931 at the age of eighteen the same doctor attended him for pyrexia for a fortnight, and noting a murmur told him that his heart was wrong and he must lead a quiet life No details are available from his doctor as he has since died The young man has no shortness of breath and can cycle a 100 miles in a day with ease

On examination he looks healthy Heart is not enlarged, the apex-beat being inside the mid-clavicular line and the area of cardiac dullness normal The sounds are clear There is a slight systolic murmur over the pulmonary area on standing, which on lying becomes louder and harsher, extending over the aortic area and up to the left clavicle Blood pressure 155/85 Heart normal radiographically. Exercise tolerance 50 per min before exercise, 80 after 20 hops, and 50 two minutes after exercise, response good, with no dyspnœa (see figs 3, 4 and 5)

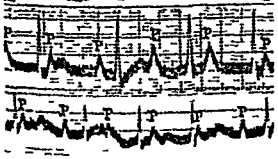

FIG 4 (case 2)—After 20 hops before each lead Ventricle 80 auricle 100

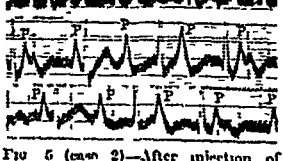

FIG 5 (case 2)—After injection of atropine gr 1/33 Ventricle 80, auricle 110

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STILBŒSTROL AND ANHYDRO-OXYPROGESTERONE

THEIR EFFECTS ON MENSTRUATION AND LACTATION

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AND

KARL JOËL, M.D.

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SINCE Cook, Dodds, Hewett, and Lawson (1934) reported the œstrogenic activity of synthetic compounds containing the phenanthrene ring, many attempts have been made to discover other compounds with similar properties

Dodds and Lawson (1937) showed that *p*-hydroxypropenyl-benzene, or anol, a relatively simple chemical compound containing only one benzene ring, exerted in castrated rats an œstrogenic effect similar to that of œstrone. A further compound, 4 : 4'-hydroxydiphenyl- α : β diethylstilbene, containing two benzene rings and discovered by Dodds, Golberg, Lawson, and Robinson (1938) was found to have a high œstrogenic activity both on oral and on parenteral administration. Fierz-David, Jadassohn, Uehlinger, and Monnier (1938) and several other investigators have fully confirmed the œstrogenic properties of this compound, which has been named stilbœstrol by Dodds

In the reports of animal experiments with stilbœstrol there is a unanimity of opinion on the qualitative identity of its actions with those of œstrone, although there are considerable quantitative differences

Kreitmaier and Sieckmann (1939) found stilbœstrol to be twenty times more active than œstrone and five or six times more active than œstradiol benzoate given by mouth. There is not yet complete agreement with regard to its toxicity towards animals. Whereas Kreitmaier and Sieckmann say that doses of 300 mg administered subcutaneously to a small dog produced no secondary symptoms, Loeser (1939a) found injurious effects on the adrenals and liver after large doses.

According to Loeser (1939a) stilbœstrol injected into the uterus does not stimulate the thyroid gland, whereas œstrone does Loeser suggests that this distinction may constitute a test for differentiating between endogenous and foreign œstrogenic substances.

The œstrogenic properties of stilbœstrol have also been confirmed in clinical studies

Guldberg (1938) induced menstruation in a castrate after the administration of a total of 20·25 mg. and subsequent treatment with corpus-luteum hormone. Engelhart (1938) obtained the same result with a total of 28 mg. in seven intramuscular injections

Other writers, including Loeser (1939b), Winterton and MacGregor (1939), and Bishop, Boycott, and Zuckerman (1939), emphasise that the action of stilbœstrol is the same as that of the natural œstrogens, in that it can (1) induce a proliferation of the endometrium, (2) abolish deficiency manifestations of the climacteric, (3) stimulate the growth of a hypoplastic uterus, (4) abolish the pains of dysmenorrhœa, and (5) prevent or inhibit lactation (Buschbeck and Hausknecht 1939, Lindemann 1939).

Divergent views have been expressed with regard to the occurrence of secondary symptoms

Buschbeck and Hausknecht (1939) found variations in tolerance to the drug, some patients tolerating as much as 21 mg daily, and others experiencing lassitude and vomiting with small doses. Some women tolerated injections but not tablets, and vice versa Ehrhardt, Kramman, and Schäfer (1939) describe similar phenomena.

Although all authors agree about the similarity of the properties of stilbœstrol to those of the follicle hormone, emphasis is constantly laid on the yet unresolved question of dosage. We accordingly sought to ascertain :—

(1) The minimal dose necessary to produce proliferation in a resting or atrophic endometrium.

(2) The dose necessary to induce a hyper-proliferation (in the sense of glandular cystic hyperplasia)

(3) The doses necessary to prevent and to inhibit lactation in the puerperium.

At the same time we sought to ascertain the dose of corpus-luteum hormone (anhydro-oxyprogesterone) given by mouth necessary to produce the stage of transformation of the endometrium with subsequent menstruation.

Observations on Castrated Women

We investigated 9 women who had for various reasons (mostly menorrhagia) been castrated with X rays two or three years ago when they were over 45 One of them was a woman, aged 63, whose menopause had occurred thirteen years ago

In each woman three trial curettages were carried out: (1) before treatment, (2) after administration

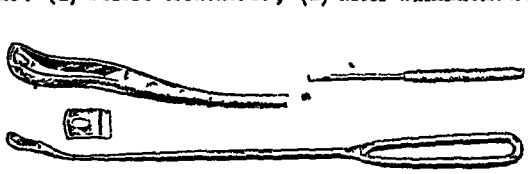

FIG. 1—Curette designed by Dr Karl Joël, showing interchangeable cutting edges

of stilbœstrol; and (3) after administration of anhydro-oxyprogesterone We wished by this means to determine histologically at each stage the effect on the endometrium. At the same time a portion of the material obtained was examined for its glycogen content.

We used a curette (fig. 1) designed by one of us (K. J.) and made by Laubscher and Co., Basle. It has the advantage that it can easily be introduced, after passing a sound, without dilatation of the cervix and has exchangeable cutting edges and is therefore always freshly sharpened.

ILLUSTRATIVE CASES

The following is a brief account of 2 of the 9 cases investigated.

CASE 1.—The patient, aged 54, had been castrated with X rays in 1937 because of climacteric hæmorrhages She had leucoplakia and vulval pruritus and kraurosis, with intense pain She was not curetted at the start of treatment. She was given stilbœstrol 10 mg (two tablets of 5 mg.) on Feb 17, 20, 23, 25, and 27, 1939, making a total dose of 50 mg. She was also given by mistake œstradiol (Ovocyclin) 5 mg. on March 1. On March 3 (the fifteenth day of the menstrual cycle) there was improvement as regards hot flushes, but the leucoplakia remained unchanged. She was curetted, a sound being passed a distance of 8 cm The ducts of the glands showed partial development of cysts of various sizes, the stroma was loosened, and occasional hæmorrhages were seen. No glycogen was found. Glandular cystic hyperplasia was diagnosed (fig. 2).

From the 3rd to the 12th she was given anhydro-oxyprogesterone 10 mg. (Lutocyclin, two tablets of

5 mg) daily, making a total dosage of 100 mg From the 12th to the 15th there was hæmorrhage On the 13th (the twenty-fifth day of the cycle) curettage showed the presence of glycogen and hæmorrhagic stroma—a stage partly of secretion and partly of glandular cystic hyperplasia

A second course of treatment followed, the patient receiving an intramuscular injection of stilbœstrol 3 mg on March 13, 17, 21, 24, and 27, making a total dosage of 15 mg Curettage on the 27th (the fourteenth day of the cycle), when a sound was passed for a distance of 9 cm , showed a stage of proliferation (fig 3), without any glycogen From March 28 to April 8 the patient received anhydro-oxyprogesterone 25 mg (five tablets of 5 mg) daily, making a total dosage of 300 mg From the 9th (the twenty-seventh day of the cycle) to the 13th there was fairly intense hæmorrhage Curettage on the 14th (the twenty-ninth day of the cycle), when a sound was passed for a distance of 8 5 cm , showed menstrual desquamation and hæmorrhages, and occasional glands showed alteration of secretion and the presence of glycogen

CASE 2 —The patient, aged 48, had been castrated with X rays in 1936 because of climacteric hæmorrhages On Feb 13, 1939, curettage, when a sound was passed for a distance of 7 cm , showed atrophy of the mucosa The patient was given stilbœstrol 5 mg (one tablet) on Feb 13 15, 18, 21, 23, 25, and 27, making a total dosage of 35 mg On the 28th (the sixteenth day of the cycle) there was some discharge Too little material was obtained by curettage for histological examination

From March 1 to 10 the patient was given anhydro-oxyprogesterone 10 mg (two tablets of 5 mg) daily, making a total dosage of 100 mg Curettage on the 11th (the twenty-eighth day of the cycle), when a sound was passed for a distance of 8 cm , showed a stage of transformation, with loose stroma and an abundance of vessels arranged typically There were definite deposits of glycogen in the epithelium and in the lumina of the glands There was no hæmorrhage

A second course of treatment followed, in which the patient received stilbœstrol 5 mg (one tablet) on the 11th, 14th 17th, 20th, and 23rd, making a total dosage of 25 mg Curettage on the 24th (the fifteenth day of the cycle) when a sound was passed for a distance of 10 cm , showed a stage of proliferation with the typical appearance of the glands and without glycogen

From March 25 to April 5 the patient was given anhydro-oxyprogesterone 25 mg (five 5 mg) daily, making a total of 300 mg

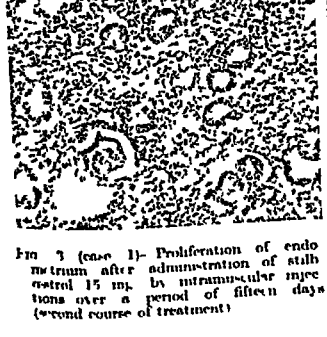

FIG 3 (case 1)—Proliferation of endometrium after administration of stilbœstrol 15 mg by intramuscular injections over a period of fifteen days (second course of treatment)

On April 2 (the twenty-fourth day of the cycle), after she had received altogether 220 mg of anhydro-oxyprogesterone, hæmorrhage appeared and continued until the 6th (the twenty-eighth day of the cycle), when curettage (a sound being passed for a distance of 10 cm) showed a stage of transformation, with abundant glycogen and with longitudinal extension of the glands (fig 4) On the same day the hæmorrhage ceased, except for a slight amount which continued until the 10th

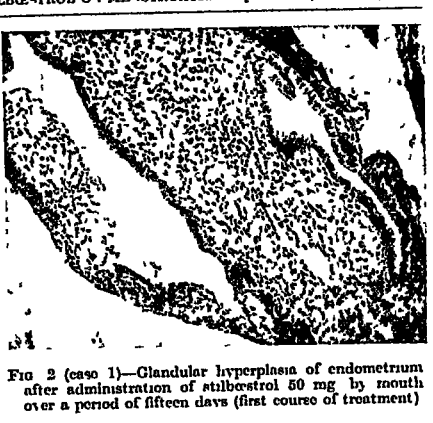

FIG 2 (case 1)—Glandular hyperplasia of endometrium after administration of stilbœstrol 50 mg by mouth over a period of fifteen days (first course of treatment)

EFFECTS OF STILBŒSTROL

At first our doses of stilbœstrol were too high We were led into this error by the high dosage of the tablets and by earlier experience with follicle hormone, which is less efficacious by mouth in a proportion of about 1 5 (Zondek 1929) With 50 mg we produced on three occasions a glandular cystic hyperplasia, which was histologically demonstrated In two other cases, in which 50 and 60 mg were given, curettage could not be performed owing to the illness of the women (influenza epidemic), and we cannot therefore say anything with certainty about the condition of the endometrium. On the basis of this experience we gave a second course of treatment to five women and produced a stage of proliferation with a dose of 25 mg —i e , with five tablets of 5 mg We may accordingly infer that the necessary dose for bringing an atrophic or a resting endometrium to the stage of proliferation is 25 mg of stilbœstrol in tablet form A dose of 50–60 mg will probably produce a glandular cystic hyperplasia By intramuscular injection 15 mg is sufficient, as we demonstrated in two cases

Besides the effect on the endometrium an effect on the myometrium was also demonstrated, similar to that already described by others (Buschbeck and Hausknecht 1930 Winterton and MacGregor 1939, Ehrhardt et al 1939 Bishop et al 1939) In all our cases an increase of 1–1 5 cm in the distance for which a sound could be passed was observed after the administration of stilbœstrol

Headache hot flushes pruritus vulvæ slight leucopl kia, and in one case neuritis were strikingly mitigated Only in two cases did the patient complain of fatigue general weakness, and nausea In one case there was vomiting These secondary symptoms were however, only fleeting and disappeared after a few days The women have remained under our observation up to the present time and have had no return of the trouble

EFFECTS OF ANHYDRO OXYPROGESTERONE

Anhydro oxyprogesterone was given by mouth after a stage of proliferation of the endometrium had

been produced with stilbœstrol. After using too little doses at first through lack of experience, we were able, by gradual increases, to ascertain the amount necessary to produce the stage of transformation with accompanying menstruation We gave at first 50–60 and 100 mg in two cases in which too much stilbœstrol had previously been administered. In these two cases, after this relatively small quantity

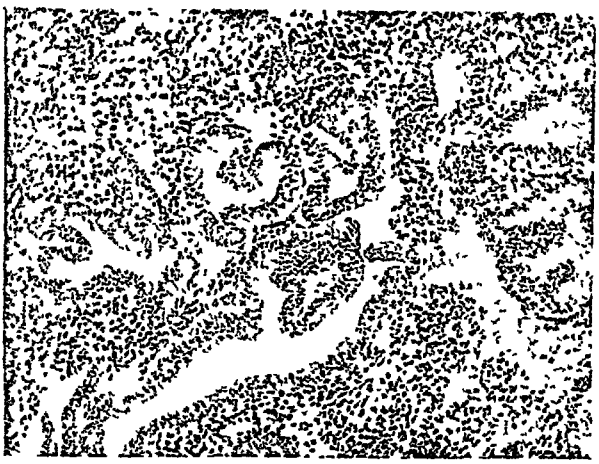

FIG 4 (case 2)—Transformation of the endometrium after administration of anhydro-oxyprogesterone 300 mg by mouth over a period of twelve days (second course of treatment)

of anhydro-oxyprogesterone, a hæmorrhage appeared. Examination of the endometrium, however, showed that there was a partial transformation and a slight amount of glycogen present, with glandular hyperplasia In two cases in which too much stilbœstrol had not been given no hæmorrhage appeared. Only in the case of the patient aged 63 was a hæmorrhage, which we must describe as menstruation, produced with 90 mg. We obtained genuine menstruation after complete transformation of the endometrium and with a positive glycogen content with 200 mg once, 220 mg. twice, and 300 mg twice On the strength of these five cases, confirmed histologically, we may infer that the dose of anhydro-oxyprogesterone by mouth necessary for the transformation lies between 220 and 300 mg. The case in which a menstrual hæmorrhage appeared after 90 mg we must regard as exceptional, and we must also assume that individual fluctuations will always appear.

We accordingly recommend that a dose of 300 mg by mouth should be considered as the transformation dose. When we compare this dose with that which is required in the case of injection of corpus-luteum hormone, which amounts to 40–50 mg. (Zondek 1935) or 60 mg (Clauberg and Uestün 1938), we have a proportion of 1·5 to 1 8 Oral medication has several advantages and was always tolerated without the production of any secondary symptoms, even in elderly women taking five tablets daily.

These doses of stilbœstrol and anhydro-oxyprogesterone must be regarded as maximal doses, for all our experiments were made on castrated women with an atrophic endometrium It is therefore possible, in the case of a resting endometrium, to produce a true menstruation with 25 mg. of stilbœstrol and 300 mg. of anhydro-oxyprogesterone by mouth.

Effects of Stilbœstrol on Lactation

Published reports have made it clear that the administration of the follicular hormone during the puerperium inhibits lactation. The mechanism of this action is explained thus. the follicle hormone prevents the secretion by the anterior lobe of the hypophysis of lactotrophic hormone, which normally first appears in the puerperium Several authors have succeeded, with various doses of follicle hormone (5–25 mg), in either preventing the influx of milk or inhibiting lactation which had already begun In the light of these observations we used stilbœstrol for the same purpose.

In 6 cases stilbœstrol was administered on the first day after confinement to prevent the secretion of milk These cases comprised 4 stillbirths, 1 tuberculous patient forbidden to suckle, and 1 multipara with depressed nipples who had never been able to suckle In 3 cases stilbœstrol 5 mg (one tablet) was given in the first twenty-four hours after confinement, in the 3 others 10 mg (two tablets) was given in one dose In all cases the treatment was successful, no milk was secreted, and the breasts remained flaccid

In 14 cases stilbœstrol was given to inhibit established lactation. The indications were hypogalactia, bleeding fissures, mastitis, eczema of the breasts, and tuberculosis. In 6 of these cases only 5 mg. (one tablet) was given, and the secretion of milk was completely arrested. In 2 of the women, however, the breasts were already flaccid and the secretion very meagre; the result must therefore be judged with caution. In 4 cases 10 mg (two tablets) was given in one dose with good results In 2 other cases the secretion of milk was arrested after the administration of 5 mg (one tablet), but after one or two days the breasts again became somewhat distended, whereupon another 5 mg. (one tablet) was administered, and the milk secretion was finally arrested, the breasts remaining flaccid In the remaining 2 cases the result was not so striking. In the first it was not possible to arrest the secretion of milk with 10 mg by mouth, and it ceased only after the additional intramuscular injection of œstradiol dipropionate 10 mg (ovocyclin P) In the second case the secretion decreased after the administration of 10 mg. but did not entirely cease. Complete inhibition was obtained after the administration of a further 5 mg. by mouth All the women took stilbœstrol without difficulty, and no secondary symptoms were observed

Our results show that the oral administration of stilbœstrol can prevent or arrest lactation. Doses of 5–10 mg. are sufficient, if given immediately after confinement, to prevent the secretion of milk with the greatest certainty. There is no need either to bind the breasts or to give aperients, and the pain from distension, which may be so distressing, does not occur For arresting lactation which has already set in 5–10 mg. is also sufficient in most cases, though in some cases larger doses were necessary (not more than 20 mg) The results are also very good, though not so striking and certain as in the prevention of lactation

From the foregoing considerations it is clear that stilbœstrol is a cheap substitute for follicle hormone, which is particularly efficacious when given by mouth and appears to be indicated for the prevention and inhibition of lactation

Summary

(1) The effect of stilbœstrol and anhydro oxyprogesterone on a patient who had attained the climacteric thirteen years earlier and on 8 women castrated by X rays was studied, and the state of the endometrium was determined by curettage.

(2) For the proliferation of a resting or atrophic endometrium stilbœstrol 25 mg by mouth or 15 mg injected intramuscularly is required

(3) With stilbœstrol 50–60 mg given by mouth a glandular cystic hyperplasia can be produced

(4) The stage of transformation and the menstruation following proliferation can be produced with anhydro oxyprogesterone 220–300 mg given by mouth

(5) Only in 2 cases were slight secondary symptoms observed after the administration of stilbœstrol, but these rapidly disappeared No secondary symptoms appeared after the administration of anhydro-oxyprogesterone in doses of 25 mg (five tablets) daily

(6) Lactation was either prevented or inhibited in 20 women by the administration of stilbœstrol 5–15 mg by mouth In most cases 5 mg was sufficient

We are indebted to Prof Werthemann and Dr Scheidegger, of the Pathological Anatomical Institute of Basle, for making the histological preparations, and to the Society of Chemical Industry in Basle (Ciba) and to the firm of Merck in Darmstadt for supplying us with their preparations

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CLINICAL NOTES

INTUSSUSCEPTION OF THE APPENDIX

A REPORT OF TWO CASES

BY CECIL P G WAKELEY, D Sc Lond, F R C S, F R S E, F A C S, F R A C S

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ALTHOUGH intussusception of the appendix is well known, less than a hundred cases have been reported, but probably the incidence is greater than this would lead us to believe, for there must be many that come to operation and are not reported

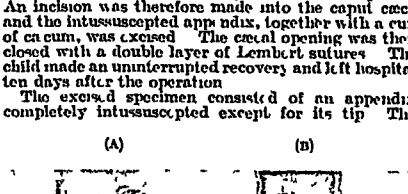
My first case was in 1919 and my second in 1938, an interval of twenty years Both patients were children, and it is interesting to note that most of the recorded cases have been in young children It seems probable that the same factors may be at work in the causation of intussusception of the appendix as are responsible for the enterocolic intussusception in infants The most constant feature in these cases is the presence of enlarged glands in the root of the mesentery and in the ileocæcal angle Also, there is a preponderance of lymphoid tissue in the terminal ileum and in the appendix This increased lymphoid tissue acts as a foreign body and causes increased and irregular peristalsis of the bowel and appendix, which at times culminates in an intussusception But this cannot always be the cause for the condition has been seen in children up to the age of 10 and even in adults, Huddy (1927) records a case in a man aged 39 Sometimes a stercolith may be an exciting cause of the intussusception, and worms may play a part

The histories of my two cases were as follows

CASE 1.—A boy, aged 10 months, was admitted to hospital in June, 1919, because of screaming attacks and diarrhœa of some two days duration The child was well nourished and apparently contented He allowed his abdomen to be palpated And finite lump was felt in the right iliac fossa, and manipulation of it caused him to scream The temperature was 100° F and the pulse rate 120

Acute appendicitis was diagnosed and the abdomen opened under gas-and-oxygen anæsthesia through a muscle-split incision in the right iliac fossa When the peritoneal cavity was opened, the cæcum was found to be hard, and, when this was delivered into the wound, only the tip of the appendix could be seen, the rest of it being invaginated into the cæcum (see figure) The terminal ileum was pulled downwards towards the tip of the appendix by the œdematous meso appendix An attempt to reduce the intussusception of the appendix was unsuccessful, for the peritoneal coat of the cæcum gave way in two places An incision was therefore made into the caput cæci, and the intussuscepted appendix, together with a cuff of cæcum, was excised The cæcal opening was then closed with a double layer of Lembert sutures The child made an uninterrupted recovery and left hospital ten days after the operation

The excised specimen consisted of an appendix completely intussuscepted except for its tip The



Intussusception of the appendix (A) external aspect, (B) on section The terminal ileum is pulled down by the œdematous meso-appendix

coats of the appendix were œdematous and infiltrated with blood, and the vessels in the meso appendix were thrombosed

CASE 2.—A boy aged 5 years, was admitted to hospital in December, 1938 with diarrhœa and vomiting of four days' duration The day before operation the doctor who was attending him noticed some blood and mucus in the stools and therefore suspected intussusception and recommended hospital treatment

On examination the boy appeared anxious and was considerably dehydrated, having vomited several times the night before admission On abdominal palpation a tender swelling could be felt in the right iliac fossa Notwithstanding its tenderness it could be moved about the iliac fossa, and the question of

appendix abscess was therefore dismissed and colic intussusception diagnosed. Rectal examination gave a negative result. The pulse-rate was 100 and the temperature 100 6° F.

Operation was performed through a right paramedian incision, and the cæcum and terminal ileum were delivered through the wound. An intussusception of the appendix was discovered and was with difficulty reduced and the appendix excised, the stump being buried in the cæcum. The boy made an uninterrupted recovery and was discharged twelve days after the operation. The appendix was œdematous and its wall in places necrotic, and the vessels in the meso-appendix were thrombosed.

It is nearly a hundred years ago that McKidd reported a case, and it seems difficult to believe that fewer than a hundred have been reported since.

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DIFFUSE SCLERODERMA AND RAYNAUD'S PHENOMENON

FROM THE USE OF A PNEUMATIC HAMMER

BY DUNCAN LEYS, D M. Oxfd, M R C P
PHYSICIAN, ROYAL NORTHERN INFIRMARY, INVERNESS

IN 1924, when he was 42, the patient, a foreman mason, first noticed numbness of the fingers of both hands during cold weather He was then working in the United States, and had begun to use a compressed-air hammer the previous year The instrument was held in the right hand and a chisel in the left He continued to use the tool until 1930. Many of his mates had noticed similar symptoms and were annoyed by them, but nobody regarded the condition very seriously. When he returned to Scotland in 1934 he went on working as a mason, but not with a compressed-air tool. His hands still worried him in cold weather, but he noticed no other disability, except that the skin of the hands appeared to be getting thick, and there was some stiffness of the hands, which made flexion and extension of the fingers difficult In January, 1939, he had a fall on the ice when he was watching some curling, and about a week later he found that the numbness of the fingers in the left hand was worse, and that the grip seemed weak.

Examination.—Now 57 years of age, he was a man of middle size with a high colour. The face was expressionless and immobile and the mouth small The skin over the forehead and cheekbones and round about the mouth was tense, thin, and inelastic. With the utmost effort to open his mouth, the vertical aperture was not more than 1¼ in The palpebral fissures of both eyes were small. There was diffuse thickening of the subcutaneous tissues in both hands, extending down the fingers, across the palm, and over the dorsum of the hand, which prevented closure of the fist and full extension of the hand

All the fingers of both hands were pale. Lewis's hyperæmia test showed an abrupt cessation of flushing at the base of the palm and at the base of all five fingers on the dorsal aspect in both hands. Radial-artery pulsation was easily felt at the wrist in both hands The blood-pressure in the right arm was 130/70; in the left arm the systolic pressure was 110, but no diastolic end-point could be obtained. All the fingernails and the toenails to a less degree showed a convexity in a longitudinal direction; there was moderate clubbing of all the fingers. The peripheral arteries in the legs (dorsalis pedis and posterior tibial) could not be felt. The tendon jerks were present in the arms and legs and there was no evidence of any sensory disturbance, nor of muscle weakness The serum Wassermann reaction was negative. Radiograms of the hands showed slight "tufting" of the terminal phalanges only.

DISCUSSION

Scleroderma and Raynaud's phenomenon are commonly associated, and Raynaud's phenomenon is an occasional sequel to the use of pneumatic tools; but I can find no previous record of the two conditions developing together in a pneumatic-tool worker. The incidence of Raynaud's phenomenon in these trades is so high that individual susceptibility can play little part in its causation To the vibration itself (aided by cold) one must ascribe the permanent changes produced in the vessels. Loriga (1929) says that permanent changes in the vessels resulting from the use of compressed-air tools are unknown, but this is not generally agreed, and Hunt (1936) finds no complete recovery from the Raynaud condition even when work is stopped for considerable periods In the present case the question arises whether vibrations caused the scleroderma as well as the partial ischæmia of the fingers, or would the patient have developed these if he had never worked vibratory machines? Whatever the answer to this particular question, legislation to regulate the use of vibrating tools now seems to be overdue. For most trades tools have been devised which minimise the vibratory effects, and no others should be permitted.

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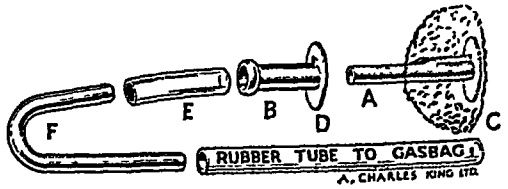
New Inventions

COMBINED SPONGE AND GAS-DELIVERY TUBE

I HAVE been using for the past few years the attachment illustrated here for prolonged administration of nasal gas for dental purposes. With this device gas is administered both through the throat sponge which is normally used by the dentist and through the nose by the orthodox nose-piece



The figure is self-explanatory. The sponge (C) is held between the collar on the male tube (A) and that on the female tube (B) The rubber junction tube (F) fits over tube (A) jamming tube (B) into place Induction is carried out in the ordinary way with a nose-piece. As soon as the patient is adequately anæsthetised, the damped sponge, ready mounted on the fitting and connected by rubber tubing to the gas apparatus, is pushed over the tongue and into the pharynx It is then immaterial whether the patient breathes through the nose or mouth

Since I have used this method I have had no difficulty in keeping any patient quiet for an indefinite time once I have succeeded in getting him really anæsthetised.

The fitting was made for me by Messrs A. Charles King, 34 Devonshire Street, London, W.1

W. H. MARSHALL, M B Camb.

MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SECTION OF NEUROLOGY AND PSYCHIATRY

WITH DR C P SYMONDS (London) in the chair, this section discussed

Symptomatic Headache

Prof HENRY COHEN (Liverpool) suggested classifying the causes of pains in the head on an anatomical basis Headache is incapable of quantitative assessment, we are therefore dependent on the patient's description of its site, duration character, and intensity Hence the patient's account of headache is often of little diagnostic value Only a small number of those suffering from headache were victims of intracranial disease Headache is the dominant symptom in "expanding lesions," meningeal irritation and diseases of the cerebral arteries In adults, the more rapid the development and the earlier and more severe the interference with the circulation of the cerebrospinal fluid, the more intense is the associated headache The dull, throbbing or bursting, splitting pain, aggravated by coughing, stooping, or straining, is associated with "expanding lesions" Pain beginning in the back of the head and radiating to the temples and frontal regions, accompanied by nuchal rigidity, is associated with meningeal irritation The migrainous type of pain is commonest in vascular lesions Yet all these types of headache have occurred in the absence of demonstrable cerebral pathology, suggesting that the essential mechanisms are functional and not dependent on an irreversible structural change Intracranial origin is suggested not by a description of the headache but by associated signs and symptoms The main factor in the mechanism of the pain is cerebral anoxia, benefit is frequently derived from the administration of oxygen

DR DESMOND CURRAN (London) said that the diagnosis of functional headaches, which were now recognised to be so common, was apt only to be reached by a process of exclusion, on the principle that it was first necessary to eliminate all possible physical causes The ruthless application of this principle could have the most unfortunate consequences, positive features should supplement the negative approach to the diagnosis

The fallacies inherent in the classical antithesis between "functional" and "organic" might lead to the erroneous conclusion that a psychiatric problem was synonymous with a psychogenic problem The head was not only something which was physically experienced but it was also something psychologically experienced as the place where our *ego is localised* It was therefore easy to understand how any threat to the ego or personality was experienced subjectively as a head discomfort or a headache, and hence why head discomforts or headache should be such a frequent symptom in mental disorder

The characteristic thing about a "functional" headache was its quality of closeness to as opposed to remoteness from the personality; it was not so much a typically sensory perception as an unpleasant experience with a special personal significance This led to the rather special proprietory attitude of "my headache" The other characteristic features of the functional headache were the selective disturbance of function and its variability in accordance with psychological rather than physical events

Much help might also be obtained from the study of the past history and personality of the individual concerned, and the presence of other symptoms of some psychiatric syndrome

DR D W C NORTHFIELD (London) said that the characteristic headaches usually caused by expanding intracranial lesions were not always accompanied by increased intracranial pressure, the pressure might in fact be abnormally low The theory that headache was due to pressure on or tension of the dura mater could now be discarded There was, however, much to support the view that headache arose from *an abnormal state of tension in the walls of the* cerebral blood vessels Biologically, headache signified a perilous position of the brain Repeatedly paroxysmal headache in a previously healthy person usually indicated a lesion needing surgical intervention

Prof G W PICKERING (London) stated that only two qualities of pain could be distinguished, the first, a sharp pain, described as pricking if the stimulus was short or burning if prolonged, arose from stimulation of the skin, the second, a dull pain, arose from structures deep to the skin He agreed with Dr Northfield that headache in intracranial lesions arose from the disturbance of sensitive structures lying round the blood vessels when they dilated A similar mechanism operated in headache produced by injection of histamine and headache associated with pyrexia He disagreed with Professor Cohen's suggestion that headache was due to cerebral anoxia One type of headache, common in healthy subjects, arose from prolonged tension of the muscles and tendons overlying the skull, and could be cured by voluntary relaxation

Dr T A ROSS (London) thought that neurotic patients often spoke of having a headache when they meant that they had painful feelings Headaches which could not be distinguished in any clinical sense from those of organic origin were sometimes undoubtedly precipitated by psychological factors

Mr NORMAN DOTT (Edinburgh) said that he also thought the pain of headache of intracranial origin arose from disturbance of the blood vessel walls, in general toxæmias also the tone of the intracranial blood-vessels was probably changed He believed that psychogenic headache was just as true a pain as that with an organic origin Pain, after all, was only a matter of faith except when we experienced it ourselves Dr RICHARD LAGER (Exeter) pointed out that headache might arise from eye strain or refractive errors the correction of which by suitable glasses gave immediate relief This cause was often overlooked

Dr D R MACCALMAN (Aberdeen) said that patients complaining of psychogenic headache often described it as unbearable This quality of unbearableness referred not to the pain but to the psychological cause producing it Psychological headache was not relieved by analgesic drugs whereas most organic headaches were, similarly the former did not affect sleep, which was indeed benefited by it, whereas the latter interfered with sleep In making a differential diagnosis one should also consider whether the headache served a useful purpose—did it relieve the patient of responsibility or unpleasantness? Psychogenic headache was never a single symptom of neurosis and one should never make the diagnosis

in the absence of other positive signs of psychogenic illness

Prof HUGH CAIRNS (Oxford) pointed out that a raised intracranial pressure could be altered by, for instance, deep breathing; it was this distention which gave rise to pain He doubted the validity of Professor Cohen's theory of anoxia, for he thought this a rare state clinically. Functional headache was not a pain in the true sense of the word. A distinctive quality not so far mentioned was its long and continuous duration; a headache which was present for more than three to four weeks was of this type Occasional migrainous attacks were a common preliminary in aneurysms

Dr. MACDONALD CRITCHLEY (London) said that typical cases of migraine often began after the age of forty, while some of them were menopausal. Although, as Dr. Curran suggested, headache was frequent in neurotics because the head was the centre of the ego, at the same time such patients often centred their pain in the lumbar region Many physicians were apt to suggest that functional headache was not real pain but obsessive thinking about pain He disagreed, for pain could be produced hypnotically which gave rise to the same effects as organic pain Psychogenic pain was as much pain as toothache

Prof COHEN replying said that Professor Pickering, Dr Northfield and he disagreed mainly on the question of the actual underlying mechanism of headache. There were two alternatives, that the painful stimulus came from the actual blood-vessel wall, and that, as a result of stimulation, the calibre of the vessels changed leading in turn to alterations in blood-supply, the resulting anoxia causing pain There was no doubt that administration of oxygen cured a migrainous attack Headache in anæmia was also more easily explained on an anoxic basis

SECTION OF OTO-RHINO-LARYNGOLOGY

THIS section met on July 26, under the presidency of Mr. H. BELL TAWSE (Nottingham), to discuss

The Bronchoscopist and Bronchopulmonary Disease

Dr CHEVALIER L JACKSON (Philadelphia) began by sketching the history of peroral endoscopy Appreciation of this method of examination had rapidly increased lately; soon every town would have its endoscopists Careful training of the endoscopist was therefore urgent In developing the technique of bronchoscopy and skill in recognising endoscopic appearances, detection and removal of foreign bodies was valuable experience The bronchoscope could be used first to elucidate symptoms of respiratory disease, such as dyspnœa, which were not explained clinically, and secondly to decide about further treatment in already recognised abscesses, unresolved pneumonias and tumours. The oto-rhino-laryngologists had initiated the technique, but Scott-Pinchin, Morlock, and other physicians and thoracic surgeons had contributed to its development. Bronchoscopy was no rival to surgery Treatment would often be bronchoscopy plus surgery As for American clinics, in some the physicians, in others the surgeons conducted the operation; in others again there was perfect coöperation between the physician or surgeon and the specialist More intensive training and knowledge for the bronchoscopist would lead to a new sense of responsibility and justify the use of the terms broncho-œsophagologist and bronchologist. The specialist was not merely an "-oscopist" but an "-ologist"

In empyema which cannot normally be treated by bronchoscopy it is sometimes found that surgical failure is due to obstruction, removal of which by bronchoscopy is followed by recovery. Bronchoscopy after an operation for empyema may reveal multiple broncholiths which can be removed Post-operative atelectasis often cleared after bronchoscopic aspiration of viscid secretion. Overholt of Philadelphia was having this procedure carried out as a preventive in some operation cases

Mr EWEN MARTIN (Edinburgh) quoted a series of 240 cases of carcinoma of the lung from the Royal Infirmary, Edinburgh, of which not one was operable Deep X-ray therapy was employed, but 200 died. Greater coöperation between physician and bronchoscopist, he thought, would lead to earlier use of the bronchoscope, earlier treatment and better results. To enable him to carry this greater responsibility the bronchoscopist required better training This could be achieved only by organising bronchoscopic clinics, but this degree of specialisation would be provided only when the State supplied the means Special broncho-œsophageal departments should be established in general hospitals Further opportunity for training would be given if the Home Office endoscopy licence regulations were relaxed to permit the pupil to practise on dogs under the surveillance of the expert The endoscopist should give the initial and final diagnosis, and his opinion as to when cases should be referred to the thoracic surgeon should be considered.

Mr. V. E NEGUS (London), in paying tribute to his training in Philadelphia, insisted that his wish had been not to improve but to simplify the Chevalier Jackson technique. In this simplified Chevalier Jackson technique the surgeon worked single-handed The instruments were kept in formalin and inserted by the surgeon in a quiver by the table The patient's head was steadied in a rest modified from the Haslinger type The Jackson type of laryngoscope with twin obliquely set lamps was used Crouching was avoided by raising the table. The patient was immobilised by means of arm rests After painting the pharynx down to the pyriform fossa with cocaine, avertin and omnopon-scopolamine were the usual preparations for œsophagoscopy Local anæsthesia alone was suitable for bronchoscopy in adults Children required rectal paraldehyde

Mr E. J. GILROY GLASS (Nottingham) said that bronchoscopy was limited in pulmonary disease in the upper lobe, where direct vision was impossible In these cases an adjuvant to bronchoscopy was bronchography, by injection of radio-opaque oil In addition to its usefulness in defining the extent of disease, this method could demonstrate occlusion of a bronchiole and make earlier diagnosis and operation possible His experience was that injection under direct vision led to loss of lipiodol by coughing on the way from ward to the X-ray room. After anæsthetising the pharynx and larynx with one per cent cocaine or a substitute, a 16 French gauge catheter was passed by direct laryngoscopy for 3 inches inside the trachea The catheter was then anchored by plaster to the cheek and the patient sent to the X-ray room There, with the guidance of the fluoro-cent screen, the radio-opaque, malleable and lead-tipped catheter was introduced into the required position For the lower lobes the erect position, and for the upper lobes the prone position with the opposite shoulder raised, was adopted By doubling the standard penetration, and in thick chests the standard

time of exposure, lesions invisible to ordinary exposure were revealed

Mr H BELL TAWSE wished to underline three themes from the discussion There must be collaboration between the laryngologist and physician and surgeon The voluntary and municipal hospitals must pool their resources and clinical material In the Nottingham endoscopic clinics more and more cases were being treated Thirdly, the surgeon doing thoracic work alone could only operate in this country in London and a few of the larger towns But even in smaller towns he felt that the oto rhino laryngologist must prepare for the arrival of the thoracic surgeon He recommended that a monthly animal endoscopy assistant's licence should be granted which could be used under the direction of the chief

Mr C A SCOTT RIDOUT (Portsmouth) said that special training should be facilitated by permission to work on dogs He himself was occasionally called on to remove foreign bodies from a dog's œsophagus

Mr P R ALLISON (Leeds) said that unless a "time" endoscopist could be always available, the surgeon must do his own endoscopy He quoted three cases (1) A man of 32 with a miner's cough which was found to be due to a bronchial carcinoma (2) A woman of 54 who was examined 3 weeks after "some toffee went the wrong way", the left lower lobe bronchus was found to be obstructed by granular tissue above an oat cell carcinoma for which pneumonectomy was performed (3) A suspected case of tuberculosis in which the bronchoscope showed only congested thickened mucosa, suction was applied through a curved catheter and malignant epithelium was removed, pneumonectomy was successful He said that 90 per cent of bronchial carcinomata were inoperable even if diagnosed relatively early

Mr I SIMSON HALL (Edinburgh) advocated preoperative bronchoscopic aspiration to prevent postoperative chest complications Mr T RITCHIE RODGER (Hull) favoured Mr Negus's head rest because it eliminated teamwork, which was impossible in small centres Dr DONALD WATSON (Bradford) concurred, Mr JAMES ADAM (Glasgow) liked preoperative aspiration and also postural drainage in bronchiectasis Mr I T I EDWARDS (Liverpool) said that whether bronchoscopy should be done by the oto rhino laryngologist or the thoracic surgeon depended on what the surgeon wanted to know No picture was so complete as the one seen by oneself The surgeon would want to see the lesion he was expected to remove Hæmoptysis in patients over 40 was serious and bronchoscopy must be done early as the margin between the operable and inoperable condition was one of only a few weeks Dr H A MCCOY (Adelaide) pointed out the difficulty of exactly defining the size of a tumour because the X ray shadow was partly due to collapse of the surrounding lung The question of treatment was therefore difficult to decide Before X ray therapy was condemned the exact dosage measurement achieved in the Holt Institute in Manchester should be considered Maximum doses should be used and the size and position of the tumour should be accurately known

Dr CHEVALIER JACKSON in reply supported the suggestion of endoscopic clinics in which specialists would treat the larynx as well as the œsophagus and bronchus The thoracic surgeon and physician should not be discouraged from doing endoscopy He commended the use of bronchography and quoted a case of pharyngeal paralysis in which a hazy shadow on a good film near the aorta on the left side was shown up more clearly by lipiodol injection, and later confirmed as a carcinoma He believed that postural drainage was more effective after bronchoscopic aspiration He had seen a pulmonary abscess cured by this means, which had also been useful in the treatment and even prevention of asthmatic attacks He agreed that the surgeon should see the lesion himself, but bronchoscopy only showed the upper edge of the tumour Exploratory thoracotomy should follow X ray of the chest and search for metastases in the bones, pleura, &c Deep X rays had been tried by Prendergast and all the Philadelphia radiologists without success in proved cancer cases So-called successes were cases of adenoma Tomography was being tried in chest as well as in larynx cases

Mr LWART MARTIN said he did not like Mr Negus's head-rest, but he favoured a clinic, run by a team of physician, surgeon and bronchoscopist working together He thought the surgeon should see the tumour he was expected to remove but need not become a bronchoscopist to deal with every case of hæmoptysis Postural drainage was ineffective without bronchoscopy and dilatation

Mr NEGUS replied that the failure of postural drainage in bronchiectasis was often due to occluding granulations in the mucosa above the cavity These could be shrunk at bronchoscopy, and the prolonged drainage effected gave relief for two or three months If obstruction was due to carcinomatous infiltration with collapse, bronchoscopy would allow expansion and accurate definition of the tumour by X rays

SECTION OF RADIOLOGY

AT a meeting of this section with Dr RUSSELL REYNOLDS (London) in the chair, a paper on

Radiosensitive Tumours

was read by Mr J RALSTON PATERSON (Manchester) He suggested that all tumours can be graded into three groups according to their response to radiation which is as characteristic as the morphology of the group The first group consists of radio resistant tumours arising from the fixed connective tissue elements of the body and including osteogenic sarcoma, chondrosarcoma, myogenic, neurogenic and fibrosarcoma, liposarcoma and melanoma The second includes tumours of limited sensitivity which are curable by radiation only if of small size and then only by heavy dosage Squamous carcinoma transitional and basal cell carcinomata and adenocarcinoma of columnar cell origin belong to this group The third group is made up of highly sensitive types and contains, apart from certain well known and already accepted embryonal tumours of the testis and ovary, a large number of tumours derived from primitive mesenchyme and originating in the hæmopoietic, lymphatic, reticular and endothelial systems which Mr Paterson calls the reticulo endothelial neoplasias An extended but not exclusive list of these conditions is as follows —

Lymphosarcoma
Lymphadenoma
Leukæmia—
Myeloge nous
Lymphath
Erythroerythæmia
Ewing, a tumour (endothelial myel oma)
Endothelioma of vascular origin—
Hæmangioendothelioma
Angiosarcoma
Multiple reticuloses —
(a) of lymphoid tissue
Lymphoma
Lymphon atosis
Lymphoblastoma follicul'are
Multiple reticuloses (*cont*) —
(b) of stromate reticulum
Malignant Christian disease
Hand-Schüller-Christian disease
Niemann-Pick disease
(c) of marrow reticulum
Multiple myeloma
Plasmacytoma
Chloroma
(d) of mesenchymal angioconnective tissue
Multiple sarcoids (Boeck's sarcoid)
Mycosis fungoides
Retinal sarcoma
Subcutaneous lymphadenomata.

It is not possible said Mr Paterson to delineate many of these tumours pathologically; the names

are landmarks between which there is no real line of demarcation. As an example, the name lymphosarcoma had been used to indicate tumours of lymphocytes and tumours of reticulum cells, and further confusion has been introduced by the controversy as to which is the primitive stem cell, the lymphocyte or the reticulum cell of the germinal centre. Lymphadenoma shows a wider range of individual sensitivity extending from the highly sensitive malignant Hodgkin's disease to the localised nodes, where the lymphoid structure is almost completely replaced by fibrous tissue and is relatively resistant. According to Ewing, the tumour which bears his name takes on three forms—angio-endothelioma, reticular myeloma and diffuse myeloma. Angio-endothelioma is the best term to cover tumours derived from primitive angioblasts and these have a wide range of malignancy yet are all radiosensitive. Tumours of the pleura, peritoneum and synovial linings are not sensitive and must be regarded as of the same type as the other fixed connective-tissue tumours. Multiple reticulosis is a wide term. The lymphoid types are closely associated on the one hand with lymphatic leukæmia and on the other with lymphosarcoma and lymphadenoma. Of the bone-marrow reticuloses, multiple myeloma is ordinarily regarded as an entity apart from Ewing's tumour.

Sensitive tumours are also found in the nasopharynx and nasal sinuses, the salivary and lacrimal glands, and in the thyroid, thymus and kidney. Mr. Paterson suggested that although these tumours may be embryonal they may well be included under the term reticulo-endothelial neoplasias since they develop in sites of complex embryonic development and some are clearly of recognised reticulo-endothelial origin. When the widespread nature of the reticulo-endothelial neoplasias is realised and their general sensitivity accepted, it is only necessary to relegate an individual tumour to this group to develop a line of approach to treatment irrespective of its exact variety. Where there is doubt as to the nature of the tumour a sensitivity test should be performed, which consists of treating a single nodule or lymphatic node, or of using a field limited to a palpable tumour, and giving a dose large enough to make any sensitive tumour show some response quite rapidly and yet not too large to prejudice subsequent treatment. It is not possible to fix a lethal dose of X radiation for each tumour of this group; while at the upper limit 4000 r in three weeks will cure the great proportion of them, at the lower limit few fail to recur after doses of less than 1000 r administered within a week or two in spite of a spectacular initial response. In general, large fields are necessary, and with such a dose systemic tolerance would not be exceeded.

The generalised reticuloses call for even wider treatment, and the sensitivity may be so great as to bring about disappearance of the tumour completely with doses of 1000 r in three to six weeks. Permanent cure is, however, rare. Mr. Paterson does not regard whole body irradiation as a practical method of treatment, since even with the most sensitive of these tumours the chance of a lethal effect is slight within the limits of tolerance. He concluded that many localised tumours of this class can be cured by full dosage and that their notoriously bad prognosis is often associated with inadequate treatment masked by a spectacular immediate response.

The CHAIRMAN supported Mr. Paterson's suggestion that both pathological and radiological interests would be well served if a registry of the diseases of the reticulo-endothelial system were formed similar to the American registry of bone sarcoma.

Thorotrast in the Diagnosis of Cerebral Lesions

Mr. ROBERT MCWHIRTER (Edinburgh) said that there are cases where after clinical examination, routine radiography and ventriculography, the nature and localisation of the lesion can only be demonstrated by the use of Thorotrast. It may be injected into the blood-vessels (arteriography), into cystic cavities, or into the ventricles. He laid stress on the value of stereography although two injections may then be required because of the rapidity with which the arterial shadow becomes obscured by that of the veins.

In the case of saccular aneurysms of the major basal arteries, while the syndrome is typical, the line of surgical treatment depends on recognition of the exact site. If the aneurysm is below the bifurcation of the internal carotid it can be treated by ligation in the neck but if above direct operative attack is necessary. Both sides of the cerebral circulation may require injection. Arteriography can also differentiate an aneurysm from hæmorrhage in a tumour or from tumours invading the cavernous sinus which may give an identical clinical picture. Arteriovenous aneurysms may cause irritative or paretic symptoms without rise in intracranial pressure. With arteriography they appear as dense irregular shadows and the feeding artery may be so visualised that ligation is possible. Failing this the condition responds well to X radiation. Tumours may distort the normal arterial relations. This sign is of particular value when the first part of the internal carotid within the skull is displaced but superficial tumours, such as post-traumatic subdural hæmatomas, may also be localised in this way. In certain tumours, particularly glioblastoma multiforme, the vascular channels of the tumour may be visualised as large irregular sinusoids, and both its site and nature demonstrated. Mr. McWhirter had found arteriography useful in distinguishing the nature of the vessels in a case of cirsoid aneurysm of the scalp. Where lateral-sinus thrombosis is suspected injection of thorotrast through a burr hole over the longitudinal sinus will indicate that thrombosis has taken place by a failure of the sinus to fill.

Often in preliminary cerebral exploration cystic cavities are found and the injection of a few cubic centimetres of thorotrast into them will enable their nature and extent to be determined. Radiography is performed three or four days later when the thorotrast is flocculated on the cyst walls. The cysts associated with simple tumours have smooth walls and the tumour may be shown projecting into one side, whereas cysts formed within malignant tumours are rough and irregular. Injection of thorotrast into the ventricular system is rarely necessary, but when the third ventricle or aqueduct is narrowed it is difficult to get air into these structures and a fluid medium then gives better results. At the time of operation the thorotrast must be washed out with Ringer's solution as completely as possible.

In conclusion Mr. McWhirter discussed the dangers that may follow thorotrast injections. In arteriography the amount used is small in relation to the lethal dose. In cystic cavities it cannot be of any real danger. When injected into the ventricles it can be washed out again, and in the few cases he has examined in this way there has been no evidence of damage over periods as long as four years after the examination.

Dr. S. COCHRANE SHANKS (*London*) commented on the high position of the straight sinus as shown in many of Mr. McWhirter's illustrations. He mentioned the danger of ependymitis following the injection of thorotrast into the ventricles and asked whether any other substance is available for this type of work.

Dr D S RUSSELL (London) said that the effect of thorotrast on the vascular system is negligible It is ultimately stored in the cells of the reticulo endothelial system When a tumour is present in the brain, however, her experimental work had shown that small vessels about the tumour are occluded, the symptoms are aggravated and recovery is slow She did not think intraventricular injection is ever justifiable since even washing cannot prevent some of the substance from remaining in the spaces of the leptomeninges, and the possibility of occlusion and of hydrocephalus later must be considered In animal experiments this has happened, and she had seen a septic meningitis follow within 24 hours in one case and diffuse ependymitis and fibroid meningitis in another

Dr A E BARCLAY (Oxford) said that other media have been tried for the purpose of arteriography Uroselectan intravenously has been found dangerous and abandoned, but Perabrodil in a 35 per cent solution in quantities of 5 c.cm gives a good shadow in arteriography, 50 per cent perabrodil may cause shock

The CHAIRMAN commented on the value of thorotrast in the outlining of aneurysm, and also in the cysts associated with tumours He agreed that the intraventricular injection of thorotrast is unjustifiable

In replying, Mr MCWHIRTER said that the straight sinus has a rather higher site than that generally indicated anatomically and thought this may be due to displacement when seen in the cadaver Stereoscopic films can be taken in 0·8 second with suitable teamwork and rehearsals He did not think that perabrodil would give sufficient contrast for this type of work Attempts now being made to combine iodine with benzene have not yet reached a practical stage Intraventricular thorotrast is rarely used and then only as the last means of obtaining necessary information The fatal dose of thorotrast is ten micrograms, in cerebral arteriography only an eightieth part of this amount is used

REVIEWS AND NOTICES OF BOOKS

Menstrual Disorders

Pathology, Diagnosis and Treatment By C FREDERIC FLUHMAN B.A., M.D., C.M., *associate* professor of obstetrics and gynecology, Stanford University school of medicine, San Francisco, California London W. B. Saunders Company 1939 Pp. 320 22*s.* 6*d.*

IT is only in the past two or three years that the fruits of the extensive post-war researches into the physiology of reproduction have begun to find their way fully into clinical literature Professor Fluhman's welcome book is an attempt "to set forth our present concepts of the physiology of the menstrual cycle in women, and the various disorders which may occur under the influence of local and systemic disease" Special emphasis has been laid on endocrinology, but without loss of the general view-point which confronts the practitioner Dr Fluhman is in a fortunate position for writing on this subject because, apart from many years of clinical experience, he has himself made several important contributions to the experimental investigation of the human menstrual cycle

The first half of the book deals with the physiology of the cycle, and the second, which will probably have a far wider appeal, with the pathology and treatment of menstrual disorders After a historical introduction, there is a discussion of puberty, in which mention is made of the seasonal onset of the menarche and the irregularity and usual sterility of the first menstrual cycles The growth and the cyclical changes of the uterus, vagina and ovaries are next dealt with, and the length of the menstrual cycle and the systemic changes which occur in relation to it are considered A brief account of the sex hormones leads on to a chapter on modern methods of investigation, these include techniques for the collection and examination of biopsy specimens of the endometrium, and tests for the various sex hormones in the urine and blood Dr Fluhman warns against the too ready interpretation of biopsy specimens because of the different histological pictures which are presented by different endometrial areas Unfortunately, the first of the two techniques which is advised for the assay of œstrogenic hormone is hardly likely to be found reliable, and will almost certainly prove misleading

The clinical half of the book opens with a chapter on the practical application of the sex hormones and the use of irradiation of the ovaries and hypophysis in the treatment of menstrual disorders The various menstrual and menopausal disorders are classified and lucidly discussed Dr Fluhman is not carried away by the promise of endocrine therapy, and maintains throughout a conservative attitude to the problems he discusses

The book is clearly written and well illustrated In general, too, it is sound, but in the physiological section Dr Fluhman sometimes subscribes with assurance to views, such as the constant formation of ova during adult life, which are by no means established Occasional half statements—for example, that uterine bleeding can occur during the course of œstrogenic stimulation—leave an incomplete and, in one or two places, misleading impression On the other hand, the discussion of such clinical questions as metropathia hæmorrhagica leaves little to be desired, and the book therefore deserves wide recognition among clinicians Experimental investigators of reproduction should also find it a useful storehouse of clinical problems, though it makes no pretence of being a textbook of reproductive physiology

Textbook of Medical Treatment

By Various Authors Edited by D. M. DUNLOP M.D., F.R.C.P.E., professor of therapeutics and clinical medicine, University of Edinburgh L. S. P. DAVIDSON M.D., F.R.C.P.E., M.R.C.P., professor of medicine, University of Edinburgh, and J. W. MCNEE, D.Sc., M.D., F.R.C.P., R.A.M.C. professor of the practice of medicine, University of Glasgow Edinburgh E. and S. Livingstone 1939 Pp. 1127 26*s.*

Of recent years new textbooks of treatment, especially from America, have been numerous Most of them claim to be modern in their outlook, critical yet constructive to dispense with the traditional "exhibition" of drugs whose power is a matter of faith more than of reason to be precise and explicit; to be up to date in respect of new and worth while methods, to use drugs intelligently, and to concern themselves as much with the management of the patient in the wider sense as with the specific therapy of his disease But the market is not so full that it cannot welcome another of the kind when it achieves these aims so fully and successfully as does this volume from the Scottish medical schools In size, form and arrangement it is a companion to the textbook of

medicine edited by J. J. Conybeare and also published by Messrs Livingstone. Its contributors are two dozen or more teachers from Edinburgh, Glasgow and Aberdeen It covers the usual range of medicine as taught in this country, together with sections on the commoner skin diseases, some tropical diseases, and some of the commoner diseases of infancy and childhood There is an excellent chapter by D. R MacCalman on psychotherapy in general practice, and a useful concluding section on technical procedures and oxygen therapy Most of its contributors have achieved a freshness of style and approach that makes the book entertaining as well as instructive to read Their matter is sound and their perspective sensible We heartily commend what Prof. A J Clark describes in his foreword as "a very practical account of the methods of rational therapeutics, of which a large proportion have been evolved during this century"

La chirurgie radicale du cancer de l'œsophage thoracique

By MICHEL BALLIVET, *ancien interne des hôpitaux de Lyon* Paris: Librairie Louis Arnette. 1939. Pp. 325 Frs 30.

In this thesis the author makes a thorough study of the present position of the surgery of cancer of the thoracic portion of the œsophagus The anatomical, physiological and surgical questions involved, the various methods of approach and the 24 successful operations which have so far been published are considered in detail Finally a careful description is given of three cases operated on by the author with his chief, Dr. Ricard, by the method of Torek All three of these patients died, two within 36 hours and one a week after operation. While this thesis contains nothing that is new, it collects together as the result of much painstaking work all that has been written to date on this difficult and somewhat disheartening subject.

Handbook of Bacteriology

(5th ed.) By JOSEPH W. BIGGER, M D., Sc.D. Dubl., F R C P.I., M.R.C.P., D.P.H., professor of bacteriology and preventive medicine, University of Dublin London: Baillière, Tindall and Cox. 1939. Pp. 466. 12*s*. 6*d*.

THIS new edition of a popular handbook has been brought up to date without losing any of its former appeal. The attractive style and the personal touch remain unchanged.

The chief new features are the chapters dealing with streptococci and chemotherapy The chapter on streptococci has been almost completely rewritten and contains much new matter, carefully chosen and concisely expounded Happily for the student and others, such terms as *Streptococcus longus* and *brevis*, alpha, beta and gamma hæmolysis are now omitted, while *Streptococcus viridans* and *Streptococcus scarlatinæ* are no longer described as separate entities. The only terms retained are hæmolytic and non-hæmolytic streptococci, the latter including *S salivarius* which produces a greenish discoloration on blood agar, and *S faecalis* which does not The author adds "this is certainly an unwarranted simplification of the true position, but for practical purposes it will suffice, until more general agreement has been reached as regards these organisms" The Lancefield groups are well described; the actual method of performing the precipitin tests, however, is not mentioned, and one wonders whether a short paragraph on this subject would not have been more useful to students and practitioners of the future than the somewhat detailed accounts, elsewhere in the book, of opsonic methods, phagocytosis and the standardisation of antitoxins.

In the chapter on chemotherapy the use of mandelic acid in urinary infections is now mentioned and a new paragraph on the uses of sulphanilamide drugs is included These drugs are also mentioned in connexion with the treatment of gonococcal, meningococcal, pneumococcal and streptococcal infections. Other additions are the description of tetrathionate broth and its uses in the isolation of *B. typhosum* from the stools The significance of the Vi titre in typhoid is stressed, *B paratyphosum* C has been added to the salmonella group, and staphylococcal enterotoxins are mentioned in connexion with food-poisoning Some modifications are introduced in the methods of concentration and culture of tubercle bacilli The tuberculin-patch test has been omitted, although this is now extensively used

In classification, the author has not invariably followed Bergey's lead in the "Manual of Determinative Bacteriology," sometimes preferring the more conservative nomenclature of Topley and Wilson Morax-Axenfeld's diplobacillus and Ducrey's bacillus are included in the genus hæmophilus with the bacilli of Koch-Weeks, influenza and whooping-cough In the chapter on technical methods, students and their teachers would perhaps have welcomed a description of Albert's staining method for *C diphtheriæ*, and of the modified method of gram staining as used by the American Society of Bacteriologists No reference is made in the chapter on blood-culture to the use of sodium polyanethol sulphonate or Liquoid Among the new illustrations are some photographs of viruses by Van Rooyen The plate representing the comparator box for determining the pH of media is less clear than in the old edition. Apart from the few omissions mentioned, the manual is very comprehensive and answers the definite purpose for which it has been written

Treatment of Rheumatism in General Practice

(3rd ed.). By W. S. C COPEMAN, M D. Camb., F.R C P., physician in charge, chronic rheumatic diseases, West London Hospital; physician to the British Red Cross Society Clinic for Rheumatism, Peto Place London: Edward Arnold and Co 1939. Pp 270. 10*s* 6*d*

THIS book is deservedly popular In the new edition chapters have been added on gout and some new methods of treatment Physical, orthopædic, and occupational therapy are fully and satisfactorily described. Throughout those arts which are based on the author's personal experience bear the stamp of close observation and practical judgment, but occasionally statements are quoted from the work of others which do not appear to have been put to the test or, in some instances at least, they would not have been mentioned The suggestions for diet in rheumatic diseases are useful but it is not obvious why vegetables and fruits liable to oxaluria should be prohibited in gout; they are indeed often beneficial, and spinach in particular was highly commended by Luff. There are more misprints than one would expect in a third edition, and a curious confusion seems to have arisen between guaiacum and guaiacol The author says he prescribed guaiacol in the form of the "Chelsea Pensioner", this however does not contain guaiacol but guaiacum, "tincture of guaiacol" will provide a puzzle for the pharmacist.

The book is written in a pleasant and interesting style and will be of real value to the practitioner.

THE LANCET

LONDON SATURDAY, SEPTEMBER 23, 1939

THE HOSPITAL SERVICES

"There is always a great waste of personnel in war You cannot provide for the average incidence of injury and disease You are either overwhelmed with work or you have nothing to do It all depends on that unknown factor, the enemy's mind Personally, I do not think we can make any real complaint about things at present They re bad, but not too bad I ve seen worse"

THESE words from a correspondent embody the long view The hospital services of this country, and especially of London, have been adapted overnight to take a new and different kind of strain, the Government's object—to secure 200,000 beds for casualties and some sort of staff and equipment for them—has been achieved, and if air-attack had already begun we should probably be regarding the arrangements as a triumph of organisation As it is, the state of the enemy's mind has provided a breathing-space in which to be critical and try to correct faults in the machinery So far as the emergency hospital services are concerned these faults, in ascending order of importance, are hardship to personnel, inefficiency of working, and neglect of the ordinary needs of the population

War breeds injustice everywhere, but we trust means can be found to rectify some of the inequalities of sacrifice demanded of the members of the Emergency Medical Service Almost all consultants in London have been mobilised, or on call, since the war began, and most of them have ceased all other work, but those who are merely "held in readiness" receive no pay, and some of those who (misreading ambiguous instructions) reported for duty at their allotted posts now learn that they will be expected to pay for their billets! The rates of remuneration are, perhaps inevitably, crude, housemen and former registrars have had their incomes suddenly raised beyond their dreams, while experienced men with heavy domestic obligations find themselves with salaries that will mean rapid (though not discreditable) bankruptcy Often they lose even more than those joining the fighting forces as juniors, for these at least have hope of promotion and of pensions for their widows Cannot marriage and family allowances and pension rights be provided in the EMS so as to reduce the penalties of dutiful citizenship? Meanwhile, consulting-room rents, insurance premiums educational fees, and income-tax demands will continue, and many consultants are asking whether they cannot take a day or two s leave each week, when circumstances permit, to keep together the nucleus of their practices If such permission were general it might be fair enough but we fear it would be wrong in principle Full time status should rule out part time practice Nor is the Ministry's offer of leave without pay generally acceptable, for consultants who have wound up their work for the time being will seldom wish to unwind it for what may be only a week or a month There is more to be said for the latest plan by which some of the senior men who prefer to return to private work will, if they wish, be released from full-time obligations, and will attend the hospitals as part-time consultants until their full services are needed

The efficiency of the new casualty service depends on its personnel and its equipment, and we are confident that it is capable of rising to any possible occasion Clearly, however, it would work more smoothly if there were some revision of the appointments made, since many people are being asked to undertake duties unnecessarily remote from those they normally perform, and great skill is sometimes harnessed to primitive tasks Both as regards equipment and economy of talent much advantage might be secured if the Ministry of Health would send commissioners to survey the whole service—starting perhaps with casualty-clearing stations and working outwards The commissioners should have power to correct anomalies, supply deficiencies, and give definite rulings, for in an organisation built hastily on a mixed foundation of local patriotism, bureaucracy, and the decisions of harassed sector officers, mortiсed by goodwill, there is necessarily much to amend Apart from official action of this kind, we believe it might be useful if the doctors in each sector or area formed a committee to canalise and present their many ideas for the betterment of the service

The neglect of everyday needs of the population has now been recognised as dangerous and hospitals in London are being encouraged to admit a few patients What is more important, however, is the reopening of outpatient departments and the return of some of the men who run special clinics —e g , for diabetics If London is attacked, outpatients must still be seen there, but whether it is attacked or not most inpatient treatment must now be undertaken in the country It is here that we come up against the difficulty that London patients cannot be admitted to the hospitals run by the authorities of other counties, and if this difficulty can be overcome in no other way it may be necessary to unify the entire hospital service under the direct control of the Ministry of Health Already the voluntary hospitals, willy nilly, are existing from week to week on the Ministry's cheques, and if municipal hospitals are to change in function and accept Government-paid staff they cannot preserve a local outlook, and their own institutions and officers may have to join the national service The past fortnight has seen the consultants of the London area sitting idle while patients in need of help have waited on the other side of inviolable barriers If circumstances have planted a first-class gynæcologist or orthopædic surgeon at a hospital outside London it seems folly not to let him, between air-raids use his talents for the benefit of the people round about. If the organisation for

this purpose does not exist, it must be improvised On another page Dr. HELEN MACKAY gives an excellent example of the sort of work pædiatricians might do among a population largely evacuated, and there is no lack of desire among any kind of consultants and practitioners to do their best in the station to which they have now unluckily been called. What they insistently demand is to be allowed contact with the patients they can help.

CAUSATION OF CARCINOMA OF THE BREAST

AN important experimental contribution to the ætiology of mammary cancer is made by GREENE in three papers [1] In 1929 he began to establish a colony of rabbits with the object of studying the incidence of neoplastic diseases among them One of the animals then purchased was a Belgian hare, which afterwards developed a cystic condition of the breast. As it was not possible to maintain the offspring of this animal by close inter-breeding, other strains of Belgian hares, and subsequently of English rabbits, were used for crossing. The English rabbits were later found to be a second source of breast tumours, which were however of a different type In the colony of rabbits thus formed a surprisingly large number of mammary tumours developed spontaneously. This is in itself interesting, because mammary tumours have hitherto been but rarely found in rabbits. It is well established that in every species of animal so far investigated the spontaneous development of cancer is focused on only one or two organs, and that these specially susceptible organs vary from species to species In the rabbit the most favoured site for neoplasia is the uterus

The mammary tumours developing in GREENE'S colony fell into two groups which could be distinguished clinically and morphologically Of 25 animals the development of neoplasia was preceded by a cystic disease of the mamma in 21, while in the remaining 4 no antecedent mammary change was observed Frequent biopsies of this material showed that this cystic condition clearly resembles that found in Schimmelbusch's disease in women. Thence it passes into a stage of non-invasive neoplasia, in which growths are found still within the normal boundaries but already possessing the abnormal cellular morphology associated with frankly malignant tumours Eventually this stage passes into the stage of invasion that characterises a fully developed mammary cancer. In the 4 animals in which the cancer did not supervene on cystic disease the malignant process was at first confined to a small number of acini, the resulting tumours showing an adenomatous structure Metastases were found in both groups of tumours, and in some animals were widespread. Of the numerous photomicrographs presented by GREENE many show a striking resemblance to those of human cancer reproduced by CHEATLE and CUTLER in their well-known book on Tumours of the Breast. In view of the constancy with which cystic disease and neoplasia succeeded each other in these rabbits GREENE concludes that they probably represent progressive stages of a pathological process

He finds further evidence of such a relationship in the fact that the endocrine system of his rabbits showed changes corresponding to those described by CRAMER and HORNING in inbred mice with a high incidence of mammary cancer and in mice in which mammary cancer had been induced by the long-continued application of œstrogens. Thus he observed extensive degenerative changes in and around the medulla of the suprarenal glands While these adrenal changes were found in association with both types of mammary tumours, changes in the pituitary were seen only in those rabbits in which neoplasia had been preceded by the cystic condition. In these animals the pituitary was greatly enlarged, the enlargement being almost wholly due to hyperplasia of the chromophobe cells of the anterior part, which in a few cases was so localised as to form an adenoma. These findings lend further support to the idea that a characteristic disturbance of the endocrine balance is concerned in the causation of the type of mammary cancer associated with an inherited susceptibility This should encourage clinical pathologists to examine more closely the endocrine organs in cases of mammary cancer, especially those with a family history of this form of carcinoma.

1. Greene, H. S. N., *J. exp. Med.* 1939, 70, 117.

TREATING ANXIETY STATES

MORBID anxiety, like cloudy swelling, is present in most people at some time or other. Anxiety is probably the commonest psychological reaction to stress, and is a frequent accompaniment of organic disease, colouring and distorting the clinical picture. It is known that the autonomic disturbance associated with anxiety lowers the threshold of visceral and somatic sensibility, and this has often been used to explain the somatic symptoms of which these patients complain In a recent paper KERR and co-workers [1] have drawn attention to the need of a fuller understanding of these mechanisms and a broader approach to their treatment. It is recognised that the majority of cases of cardiospasm, pylorospasm and spastic colon have a basis of anxiety, and the authors point out that while drugs of the atropine group are valuable when excessive peristalsis gives discomfort, psychological investigation offers hope of an understanding of the nature of the disease and the possibility of a permanent recovery. It is a pity that most of the cases of anxiety state with somatic symptoms are treated either by suggestion and drugs which can act only by suggestion, or by sedatives such as bromide and phenobarbital, psychotherapeutic investigation being omitted for economic reasons or from lack of time The results of such palliative treatment are good, because the initial causative environmental stress passes with time, and a certain equilibration of psychic conflicts takes place But the fundamental maladjustment, the psycho-pathological process, remains unchanged The authors point out that despite

1. Kerr, W. J., Gliebe, P. A., Soley, M. H., and Shock, N. W., *J. Amer. med. Assoc* 1939, 113, 637

active treatment there will always remain a small group of "psychopathically and protoplasmically" inferior patients who are untreatable The danger would appear to be the tendency to include in this group many of those hypochondriacs whose symptoms have developed during the course of an untreated anxiety state which has lasted for years and in which the anxiety is now latent In the clinics and out-patient departments of this country will be found many such patients towards whom the doctor has developed an attitude of complacent nihilism This group constitutes a large proportion of the chronic neurotic population and is becoming a slur on psychiatry If it is vital to exclude the organic it is even more important to exclude it rapidly and finally, as the habit of recurrent test-meals, X rays and blood-counts, without coincident psychological investigation, produces the soil most fertile for hypochondria Again, hypochondria is encouraged in just those cases that are treated by suggestion and drugs alone, whether or not they recover, because in the latter event the patient's initial resistance to the psychological approach is reinforced by the conclusion that the original cause of his trouble must have been physical, since it was relieved by medicine

MEDICAL LIBRARIES IN WAR-TIME

FOR one reason or another the first fortnight of the war found three of the principal medical libraries closed, one with half its stock boarded up and inaccessible, one with three-quarters and another with the whole of its staff gone We trust that this does not represent the general policy to be followed, for as the work of the medical profession becomes greater, not less, in war-time than in peace, its need for information may be more, not less, urgent. In a long war the profession will need the most up to-date information that can be provided by well-equipped and efficiently managed libraries The chief requirements as we see them, are fourfold an adequate service for the loan of books and periodicals and the supply of information to the medical officer overseas, a similar service for the profession in this country, library facilities for medical students in the centres to which they have been transferred, if such are not already present, and the usual or rather enhanced, provision of material for the essential research that must be carried on

To coordinate all the sources of information a central bureau should be set up by some such body as the Ministry of Information or the Medical Research Council Any doctor wherever he is, who requires a book or piece of information for essential work, should be able to obtain it without formality and with the least possible delay through the agency of this central information bureau which in its turn should be able to draw upon the resources of all medical or scientific libraries able to produce the required book or information The present is no time for parochial considerations and all medical libraries whether belonging to government departments, university institutions or private societies, should coöperate to the fullest possible extent, relaxing if necessary some of their usual rules and restrictions If this entail, as it probably will, extra cost, and to private societies loss of revenue owing to the removal of any special privileges due to membership, this may have to be made good by government subsidy In time of war facilities should not be withheld merely because those requiring them do not happen to be members of the particular institution able to provide them This raises another question—that of skilled library staffs Medical libraries are of little if any use without librarians During the last war the library of the Royal Society of Medicine had such demands made upon it by the medical officers of our own and allied armies that it was found necessary to obtain exemption from military service for its expert staff The need this time, as we have indicated above, will be even greater, yet there is no mention of medical librarians in the Ministry of Labour's list of reserved occupations, and we learn that already some members of medical-library staffs have been called up for the Army, while others, less excusably, have been given notice to leave without any alternative work being offered to them

One final word Just as the healing art knows no national frontiers but is at the service of friend and foe alike, so medical science is international Though doctors are temporarily cut off from personal intercourse with their colleagues in enemy countries, they cannot afford to be deprived of the latest medical literature of such countries We are glad to hear that this question has already been considered by the Booksellers' Association and that a deputation is to be sent to the appropriate government department It is essential that no prohibitions on trading with the enemy should be allowed to hinder the exchange of medical information across national frontiers

SAFETY FIRST

IN spite of the instinctive contraction of expenditure in war-time, and the prospect of still heavier taxation, the practitioner is emphatically advised to maintain his membership of a professional defence society War may bring many medical men into even closer relationship with the public Previous experience indicates that, while hostilities are in progress, people are slow to embark upon litigation, but, when peace comes they bethink themselves of all sorts of legal rights, justified or otherwise It is common knowledge that nearly fifty per cent of the allegations of negligence and malpraxis occur when the doctor has sent in his account for fees The recovery of fees will not become more easy now, nor presumably will the allegations become less frequent It is not merely the worry of these allegations against which the practitioner needs to be protected When his defence succeeds, he may find himself unable to recover any costs from an impecunious plaintiff The report of the Medical Defence Union to be presented to the annual general meeting next week, contains evidence of the manifold risks to which the practitioner is exposed

ANNOTATIONS

PRESERVATION OF BLOOD FOR TRANSFUSION

MANY people nowadays are wondering how best to preserve blood for transfusion, and there is still no universal agreement as to the best anticoagulant. Until lately sodium citrate was almost the only anticoagulant available Heparin is now on the market but there is as yet no evidence that it has any advantage over citrate and expense seems likely to limit its use on a large scale. Sodium citrate was in general use before the question of storing blood for transfusion had arisen. On the assumption that a 3 8 per cent. solution is isotonic with human blood it was usually used in this strength Actually such a solution is isotonic with rabbit's red cells, whereas human red cells are isotonic with a 3 5 per cent solution The difference, however, is of little importance. The addition of 10 c cm of 3 8 per cent solution of sodium citrate to 90 c cm of blood has been used for a long time to prevent coagulation and is entirely satisfactory. Some workers use higher concentrations; Schöncher[1] recommends 5 c cm. of a 10 per cent solution to every 95 c cm of blood, giving a final citrate concentration of 0 5 per cent. Others, impressed with the possible depressant effect of an excess of sodium ions in the circulation, have used citrate in amounts to produce a final concentration as low as 0 25 per cent. (Knoll and Markl[2]); this has been equally satisfactory in preventing coagulation.

All simple citrate solutions are used in bulks of from 5 to 10 c cm to every 100 c cm of blood, thus producing minimal dilution of the blood. Under these conditions, blood keeps satisfactorily for a week or even longer. Thereafter some degree of hæmolysis appears and is invariably present after ten days Even in the face of slight hæmolysis, the blood may still be used for transfusion with satisfactory results Many attempts have, however, been made to devise anticoagulant fluids which would delay the onset of hæmolysis Most of these call for a much greater dilution of the blood than do the simple citrate solutions One of the first of these fluids was that of Bagdassarov,[3] usually known as I H T This is mixed with blood in equal volume and gives a final citrate concentration of 0 25 per cent , in addition to the citrate, it contains sodium and potassium chloride and magnesium sulphate Elliott et al[4] report favourably on it but Harrington and Mills[5] could find no value in the extra salts They recommend a solution of 1·05 per cent sodium citrate, 0 3 per cent glucose and 0 15 per cent. sulphanilamide dissolved in normal saline and added to the blood to be preserved in the proportion of 1 to 2; this gives a final dilution of the blood by one-third and a final citrate concentration of 0 35 per cent.

Only experience can show the ideal anticoagulant and preservative fluid for blood storage At present we may say that blood stored with sodium citrate added so as to produce the minimal dilution and to give a final concentration of 0 3 per cent citrate or over will form no fibrin; further, provided it has been kept sterile, it will not show hæmolysis for a week or even longer, and will remain suitable for transfusion for at least ten days. It still has to be shown that greater dilutions make longer storage possible It goes without saying that stored blood should be kept reasonably cool; a temperature of about 4° C is usually recommended and is quite satisfactory; refrigeration, although desirable, is not essential; granted sterile withdrawal, a satisfactorily prepared anticoagulant and clean bottles, blood will keep in a state suitable for transfusion in any cool room such as a cellar or larder for a week or longer.

1. Schöncher, F *Münch. med. Wschr.* 1939, 33, 1268.
2. Knoll, H., and Märki, H., *Schweiz. med. Wschr.* 1939, 33, 744
3. Bagdassarov, *Sang*, 1937, 11, 466
4. Elliott, G. A., Macfarlane, R. G., and Vaughan, Janet, *Lancet*, 1939, 1, 384.
5. Harrington, C. R., and Mills, A. A., *Brit. med. J.* 1939, 1, 1202

SEEING IN THE DARK

THE blackout has made us more aware of the extent of the sensitivity of the retina when it is dark-adapted and the differences between vision during daylight and vision at night Hecht[1] defined the dark-adapted eye as one "whose sensitivity to light has reached a constant value as the result of a sustained stay in the dark" Before the eye becomes adapted there is a latent period of a few seconds when everything looks black, followed by a sharp rise in sensitivity for about 30 minutes, then a slowing, until at the end of an hour dark-adaptation is complete.[2] Vision in the dark-adapted eye takes place in the periphery of the retina and is a function of the rods in which the visual purple is contained. The central portion of the retina undergoes little or no adaptation and central vision is therefore not so good as peripheral This can be shown by looking at a group of stars directly—i.e., with central vision—when perhaps 4 or 5 will be counted. If, however, the group is looked at from one side so that the image falls a little distance from the fovea 6 or 7 will be visible Anything which interferes with the function of the periphery of the retina or the formation of the visual purple will prevent adaptation Night-blindness occurs in diseases of the pigment epithelial layer of the retina, such as retinitis pigmentosa Visual purple is said only to form when the rods are in contact with healthy pigment epithelium; night-blindness, however, does not occur in albinos.[3] During the last war night-blindness was found in conjunction with diet deficiencies and it responded well to cod-liver oil Vitamin-A deficiency has been found to account for night-blindness in some cases, and it has recently been suggested[4] that those about to undertake night work, such as driving a motor-car, should first fortify themselves with a vitamin-A concentrate in order to ensure the proper functioning of the visual purple

Peripheral vision is not nearly so acute as the central vision of the daytime, but in the dark-adapted eye movement is more clearly seen peripherally. Therefore, although it may be difficult to define the nature of an object at night if it moves, that movement can be seen—a fact of great importance when dealing with traffic in a blackout The clearness with which an object is seen depends very much upon its background Colour is recognised earlier if there is any illumination, however feeble, in its vicinity. Different colours are more easily seen on different backgrounds Thus red and yellow are seen earlier on white and green on black.[5] On a moonless night shadows are virtually absent, so that stereoscopic vision is less efficient, and distances consequently harder to judge. As the eye becomes dark-adapted the apparent brightness of colours changes In daylight yellow is the brightest

1. Hecht, J., *J. Gen. Physiol.* 1927, 10, 783
2. Adler, F. H., *Clinical Physiology of the Eye*. New York, 1933, p. 199
3. Duke-Elder, S. W., Textbook of Ophthalmology, 1932, vol. i, p. 952.
4. Vaillant, C., and Gillis, L., *Lancet*, 1939, 1, 149.
5. Aubert, Physiologie der Netzhaut, 1865

colour At night green becomes more easily recognised than yellow, blue, and red—in that order This fact becomes apparent on taking a country walk when the green of the grass becomes the most easily seen colour In the completely dark adapted eye vision is achromatic and all colours have the same hue, differing only in intensity

IMMEDIATE CLASSIFICATION OF HEAD INJURIES

THE early and wise classification of casualties is one of the most essential parts of war medical service Ambulances must not be filled with moribund or dead patients, when there are others whom surgery can save Sinclair-Loutit[1] emphasises the need for the special study of head injury in this light He points out that a patient who is in coma may merely be suffering from extradural haemorrhage which can be readily relieved by operation whereas a restless patient may have the mid brain sectioned and be beyond all help From his experience in Spain he concludes that the following three signs are of very grave import a continual discharge of cerebral matter, a very feeble pulse (the rate being less important), and what the Spaniards called "carfologia sexual"—a continual fumbling with the genital organs

Head wounds are never easy to classify, and the difficulties are greater under war conditions at a receiving-post It will probably be agreed that wherever there is a strong pulse the chances of recovery are fairly good even when the patient is deeply unconscious, provided any necessary surgical treatment can be promptly carried out On the other hand if a pure brain injury is associated with profound shock and coma, with a feeble and accelerating pulse, the prospects are poor At the same time it must be borne in mind that the signs of shock may be due not to the brain injury, but to some complication such as haemorrhage from the scalp, exposure or injuries to other parts of the body The neurologist can obtain further information in these cases from his investigation of the nervous system but the casualty officer may be advised to concentrate his attention on the state of the patient's circulation in his attempt to pick out cases suitable for major surgery He will do well to remember Sinclair Loutit's observation that many favourable cases are mentally confused or even comatose when the patient is first seen

A WAR-TIME PHARMACOPŒIA

THE upward movement in the prices of drugs has accelerated, it has also spread over a wide range of articles In some cases the advance in values has been great, but this does not necessarily imply that there is an acute shortage of such drugs, nor does it indicate that supplies cannot be replenished One of the reasons for the almost general advance in prices is the desire expressed suddenly and almost unanimously, on the part of all concerned to enlarge their stocks There is "a run on the bank" as it were and the bank has not sufficient bullion actually in its till to meet the run Nevertheless, the bank is solvent In the meantime importers of drugs and dealers and all others who constitute the central market for drugs have found it necessary to put a brake on the demands of customers who come to them with unusually large orders wisely enough manufacturers and wholesale dealers are rationing buyers, especially those who want to buy too much at once On another page will be found an indication of recent price changes In our correspondence columns last week the chief pharmacist of one of the large London hospitals suggested the need to husband the supplies of some of the substances of no great therapeutic value which are now being widely prescribed He had in mind such things as flavouring syrups, ointment bases and alcohol in tinctures, and he suggested the setting-up of a medico pharmaceutical committee to compile a formulary for war-time use It should, however, be borne in mind that we have a British Pharmacopœia Commission whose statutory duty it is to deal with precisely such circumstances as these, and although its ordinary work of routine investigation and laboratory control may lapse for the moment, an emergency organisation has been formed to deal with current matters as they arise While at present there are in this country ample supplies of drugs and other ingredients of medicines it may become necessary at any time to make changes in the B P formulæ or to introduce new formulæ in order to conserve supplies Changes of this kind can only be made official by means of an amending supplement or addendum published by the General Medical Council by virtue of its power under the Medical Acts These possibilities are, we understand, receiving careful attention, and communications for the B P Commission may be addressed to the secretary, Dr C H Hampshire, at 44, Hallam Street, London, W 1

ACCIDENTAL TRANSMISSION OF MALARIA

THERE are now many records of the transmission of malaria by blood transfusion, in some of which the donor has shown no sign of the disease for years and no doubt seemed a safe source of supply Lesne, Cayla and Lichtenberger[1] report the case of a child aged 7 months, suffering from severe bronchopneumonia who received seven daily intramuscular injections of the father's blood 60 c cm in all The child recovered and all went well for about two months when it developed the typical regular intermittent fever of quartan ague, and had twelve febrile paroxysms in all No malarial parasites could be found, but the child's spleen was enlarged and the condition seemed so obviously malarial that quinine was given and the fever ceased forthwith Six weeks afterwards there was a relapse which was again treated successfully with quinine, and two months later, although there had been no further febrile attacks, malarial parasites were found—young intracorpuscular forms, rosettes and a gametocyte of *Plasmodium malariæ* The source of infection was ostensibly the father, who was born in Cameroon and had lived there until thirteen years before, when he had come to France immediately after having had several attacks of fever, presumably malarial In France he had shown no signs of malaria, and an examination of his blood, made a week after parasites were found in his child, failed to reveal any parasites In *The Lancet* of Sept 2 (p 550) Dr Navarro and Dr I dward recorded a similar case in which an infant one week old received an intramuscular injection of 7 c cm of paternal blood for subarachnoid and gastrointestinal hæmorrhage which did not recur after the injection About five weeks later she developed restlessness anorexia and sweating, and had several small epistaxes and convulsions When the child was readmitted to hospital at the age of ten weeks her liver and spleen were found to be large there was high fever and blood examination revealed the presence of typical quartan parasites with severe anæmia She went rapidly downhill and died before

1 Sinclair-Loutit K W C, *St Bart's Hosp J* June 1939 1 136

1 *Ter Folyol. Med* 1939, July 15, p 92

specific therapy could be started. On post-mortem examination malarial parasites and brown granular pigment were detected in the liver and spleen. In this case, as in the former, the father was born in a malarious country—Ceylon—which he left twelve years ago,[2] and although he had been in the habit of taking quinine prophylactically he had never knowingly suffered from malaria and had been quite healthy since leaving Ceylon. Nevertheless, he was definitely harbouring parasites in small numbers, for, although blood-films at first failed to show them, the injection of 10 c.cm of his blood into a patient with general paralysis produced malaria in that patient, and the father subsequently had a short attack of fever during which a few parasites were detected in thick blood-films. Wright[3] has lately collected records of 29 such cases, in more than half of which the donors had never had recognisable symptoms of malaria. The possibility that donors from tropical and sub-tropical countries, however healthy, may be a source of malarial infection must be borne in mind when recipients develop fever of the tertian or quartan type, or, with a double tertian infection, even a sharp rise of temperature each day. Where infection is transmitted by blood-transfusion the incubation period will probably be short, and not unduly long as it sometimes is after intramuscular injection

A GREAT INVENTOR OF LITTLE THINGS

THE recent unveiling of a monument to the chemist Stanislas Limousin in his birthplace, Ardentes-en-Berry near Châteauroux, France, has revived the memory of a fertile inventor Limousin was born in 1831 and spent much of his comparatively short life (he died in 1887) in Paris where his pharmaceutical activities were prodigious All pharmacological problems in his day were at once put before him Consulted as to how obnoxious drugs could be swallowed, he promptly invented the cachet made of unleavened bread or wafer paper in which to wrap them. So simple! So ridiculously reminiscent of Columbus and the egg! When hypodermic medication came into fashion, Dr. Duhomme appealed to Limousin to devise some satisfactory means for providing sterile solutions of uniform strength He thereupon invented the glass ampoule which is employed to this day as universally as the name of Limousin is forgotten. This invention proved most welcome at the time, for toxic effects from overdoses and polluting infections threatened to bring discredit on the whole system of hypodermic medication. It was Limousin also who devised the 30-litre rubber balloons for holding oxygen, and his expert opinion was sought when the unlucky aerostat, the "Zenith," came into being. When the inhalation of oxygen was in fashion in 1874, Limousin organised an inhalatorium in his pharmacy where all who wished could breathe pure oxygen to their heart's content The list of drugs which Limousin unearthed from obscurity, and to which most of them seem sadly enough to have returned, includes piscidia and the sulphovinate of quinine, solutions of which he prepared for subcutaneous injection in malaria It was Limousin who, with his genius for solving big problems with simple devices, hit on a plan for warning the unwary about the poisonous properties of certain drugs Just give them an alarming colour! In due course official approval was given to this notion, and the sublimate of mercury issued to midwives was coloured with indigo-carmine. The automatic pipette was another of his inventions Strange that such a benefactor of the human race, so recently dead, should already have become as unknown to most of us as piscidia itself!

MORPHINE OR BARBITURATES BEFORE CYCLOPROPANE?

THE increasing use of cyclopropane gives importance to the selection of the most appropriate drug for premedication when one wants to give some adjuvant sedative or hypnotic before the anæsthetic itself The fact that cyclopropane is in no sense a respiratory stimulant—wherein it differs from some other anæsthetics—would in itself probably make anæsthetists chary of using beforehand any agent that tends to depress the breathing Chief among these is morphine, and the belief that this should be avoided before administering cyclopropane is strongly supported by some experimental studies in the United States[1] These show that dogs given morphine before cyclopropane react less favourably to the anæsthetic Not only is respiratory arrest more readily brought about but also certain irregularities appear before the respiratory arrest—a phenomenon rarely met in dogs having cyclopropane alone. On the other hand, the investigators found that barbiturates given beforehand had a beneficial effect, to the extent that dogs treated with them behaved better not only than those which had morphine but also better than those given cyclopropane only. They believe that whereas cyclopropane intensifies the bradycardia and arrhythmia of dogs given morphine, the barbiturates lessen vagal tone and decrease the irritability of the automatic tissues of the heart; a barbiturate should therefore be given in place of morphine when cyclopropane is used clinically These experiments will confirm a practice that has already been adopted, on empirical grounds, by a good many of the anæsthetists who have wide experience of cyclopropane

THE MINER'S IMPROVED LOT

AT the end of 1933 the number of men employed in coal-mines was 772,000, the total mining population being estimated at 3,000,000 Coal-mining is a hazardous industry and beside the risk to life there is hardship and discomfort, while, in the past, the amenities of the mining community have been too little regarded The recent annual report of the Miners' Welfare Committee[2] indicates a welcome change in attitude The receipts of the welfare fund amounted in 1938 to £819,458, and since the fund was started in 1920 a sum of £17,500,000 has been expended. A definite proportion of this money must by law be allocated to the provision of pithead baths, and grants for this purpose in 1938 constituted 62·4 per cent. of the total When present applications have been satisfied, 75 per cent of the workers will be able to bathe; those who still must do without are for the most part employed in quite small mines. The baths are equipped with first-aid rooms for the treatment of minor injuries, and with canteens. Illustrations in the report show the care which had been bestowed on choice of site and design The next item of expenditure, 17·2 per cent of the total in 1938 and 32 per cent. since 1920, has been in respect of recreation: the term covers 1400 schemes of varying type—parks, recreation grounds, children's playgrounds, institutes, libraries More direct health schemes include the provision and maintenance of

2. In the article by Dr David Nabarro and Dr D G. M. Edward, line 25 in col 2 of p 557 should read " . . the father was born in Ceylon in 1908 and had lived there until 1926 "

3 Wright, F H., *J Pædiat.* 1939, 12, 327.

1 Robbins, B. H. Baxter, J. H., jun., and Fitzhugh, O. G., *Ann. Surg* July, 1938, p. 84

2 Miners' Welfare 1938. H M. Stationery Office 1s 6d.

15 convalescent homes, and grants to hospitals, nursing and ambulance services. The last year has shown a new development following the introduction of holidays with pay, the Derbyshire committee has prepared a scheme for a chalet holiday centre at Skegness, with accommodation for 900 persons at a weekly charge of 8s. for adults and half that amount for children. The report indicates how much may be effected in industry by willing cooperation, vision, and humanity.

INOPERABLE CARCINOMA OF THE RECTUM

A PLEA to general practitioners to accept the serious responsibility involved in the management of cases of inoperable carcinoma was recently made by Dr. Thomas Hamilton of New South Wales.[1] It is wrong, as he says, to assume that an incurable growth precludes all chance of restoring the patient temporarily to active enjoyment of life. A great deal can be done by the personal interest of the doctor to allay the anxiety both of the patient and of his relatives. A diagnostic exploratory laparotomy has to be considered in most cases of abdominal growth. Hamilton thinks that it should be undertaken whenever the practitioner cannot be quite sure that operative cure is impossible. He also cites two cases, one of chronic pancreatitis and one of gastric ulcer, in which operation disproved the previous diagnosis of cancer. Occasionally, also, chronic constipation with faecal impaction may only be diagnosed at laparotomy. In advanced cases operation even if confined to laparotomy, may be enough to cause the patient's death, and this should be put before the relatives. Mr. Duncan Fitzwilliams, on another page of this issue, advocates laparotomy through a median incision below the umbilicus in advanced cases of rectal carcinoma rather than the performance of a blind colostomy. It is possible to give a much more accurate prognosis if the degree of extension and metastasis is known. Where radical removal is contra-indicated by local extension the patient's age or the general health, and where there are no metastases radium therapy and a well-acting colostomy have to be seriously considered. Fitzwilliams believes that the advantages of a colostomy are so great that it should be advised even before obstruction has arisen. The absence of irritation by the passage of faecal matter over the surface of the tumour lessens the inflammatory reaction and probably the rate of growth, and the general condition of the patient is improved and colicky pains disappear. Fitzwilliams thinks that in the advanced case there is no contra-indication to the use of radium and that nothing but good can come of its use. This is not a universal opinion for some surgeons are convinced that radium, while it may shrivel up the tumour does produce a very great increase in the pain. The chances of cure are much less than with such epithelial growths as carcinoma of the cervix and the screening of the radium must be efficient if untoward local reaction is to be avoided.

R. A. Gardiner[2] writing from the radium and X-ray department of the Prince Henry Hospital, Sydney, says that though radium has cured cancer of the bowel and in other cases has rendered inoperable growths fit for operation it cannot compete with operative removal. As might be expected the good results reported by him are in anal epithelomata. The two main methods he has used in carcinoma higher than the anal canal are the implantation of seeds into the growth and the application of tubes of radium or radon through a proctoscope or sigmoidoscope. Fitzwilliams has found the best method of application is by means of strands of twisted copper wire. He uses 20–30 mg. of well screened and protected radium mounted on four such strands and guides them through the structure by the finger or through the sigmoidoscope. The radium is left in position for twelve hours, and is then removed and inserted for twelve hours into the lower colostomy opening. If it has the effect of retarding the local spread of the growth and stopping the discharge of blood and mucus even for a time, there is a chance of improving the patient's general condition and mental outlook. The treatment of the anæmia which is so common is well worth undertaking, and intelligent care of the colostomy and instructions about suitable diet will make the patient less of an invalid. When to tell the patient the truth has to be decided in many cases. Hamilton thinks it is best to tell him the facts calmly and frankly at the stage when he has become impatient at his delayed recovery and at his increasing weakness. If he has had an exploratory operation he may have all along been uneasy in his mind that his recovery from the operation has not, as Hamilton puts it, been greeted with more enthusiasm by his relatives.

1 Hamilton, T. *Med. J. Aust.* 1939, i. 817.
2 Gardiner, R. A., *ibid.* p. 829.

A TROPICAL RETROSPECT

Of all the themes for the medical historian, none is more fascinating than tropical medicine. The struggle against disease in the tropics has had for its setting India, Australia, and colonies and protectorates of the great powers, not to mention the Suez and Panama Canal zones. In two large volumes Dr. H. H. Scott[1] has traced the evolution of this branch of medicine with clarity, good judgment and humour. How far we have moved is shown by the description of conditions in the early days of the East India Company (for India, Scott acknowledges his debt to D. G. Crawford's "History of the Indian Medical Service"). At that time a surgeon-general on a salary of £20 to £30 a year, had not only to treat the sick but to cut every forty days and in a seemly manner the hair of the company's humblest employees. The story of yellow fever is intimately connected with the Panama Canal and Gorgas, "that modest little man with silver hair" as C. E. Flynn described him. He was ridiculed for his insistence on sanitation by the governor of the Canal Zone, and by the Canal Commission who elected to live safely in New York, and his displacement was determined on by the governor in favour of an old friend, an osteopath. A personal visit to the zone by the president, Theodore Roosevelt, made Gorgas secure by appointing him a member of the commission. Even then the chief engineer remarked "Do you know, Gorgas, that every mosquito you kill costs the United States Government ten dollars" to this the reply was 'But just think, Colonel, one of those ten dollar mosquitoes might bite you, and what a loss that would be to the country." Scott gives a delightful pen picture of Manson, working almost to the last "hobbling with the aid of a stick, or being wheeled from bed to bed in the hospital, benignant, kindly and sympathetic patient with everything but sickness and insincerity, courteous to all." One calls to mind the unrehearsed tribute to Ross when he was wheeled into a meeting of the Royal Society of Tropical Medicine and Hygiene to receive the Manson medal and the fellows stood as his chair passed forwards. Scott's book is a fitting tribute to these great pioneers of health in the tropics.

1 A History of Tropical Medicine. London: Edward Arnold and Co. 50s.

SPECIAL ARTICLES

SIMULATED MENTAL DISORDERS AMONG SOLDIERS IN THE LATE WAR *

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THE diagnosis of malingering is often very difficult and any attempt to estimate the extent to which it took place among soldiers in the late war would be an almost impossible task. Conditions of life on the front were such that they provided the strongest motives for getting out of the fighting line, yet those with experience will, I believe, agree that few men attempted to do so by means of simulated illness It was interesting to see how naturally the process of adaptation took place to the fear- and horror-producing situations which constitute the psychological essence of war in the trenches This adaptation remained even in the last years of the war when the intensity of shell-fire became very great Sometimes the adaptation mechanism did give way, either as the result of too long continued strain or a sudden shock such as being blown-up or buried. Some were unfitted by temperament for the life from the start and were never able to adapt successfully. But it was an impressive fact that the ordinary man, coming from a peaceful occupation amid peaceful surroundings, rapidly and spontaneously accustomed himself to such an abnormal existence and settled down cheerfully to it

The constant strain of this strange life became clearer to the individual in perspective when, on account of sickness or wounds, he was sent away from his unit and his friends out of the fighting area He would have been more than human if he had not appreciated the relief, especially if the sickness or injury did not happen to be serious Among the war-neuroses seen at an advanced centre in France, malingering showed itself mainly as a tendency to perpetuate the existence of symptoms which would otherwise have passed away in due course, and to exaggerate the severity of those which were present (Dillon, 1939). Other cases, however, also appeared from time to time in which purely or largely artificial states were developed often of considerable complexity It is with these that this article is concerned The cases described include only those in whom evidence of malingering was considered to be conclusive

Simulated symptoms are generally considered to express a conscious and deliberate intention on the part of the individual, whereas those of the neuroses are looked upon as results of unconscious motivation The distinction between the two, however, is by no means sharply delineated. Conscious and unconscious motives may be combined and it is quite common for a malingerer, if he has undertaken to imitate an easily sustained disability, to become in the end persuaded of its reality—in much the same way as the man who recounts often enough an exaggerated story of his prowess comes in the end to believe it

CASE 1

A private in an infantry regiment, aged 28, was admitted to hospital in March, 1917, with a note from the regimental medical officer saying that he considered the man was unfit for duty in the trenches and should not have been sent back after a previous attack of shell-shock. When seen shortly after admission, the patient was in an intensely restless, excited state. He appeared to be constantly overcome by terror, acting as though he heard shells coming towards him Every sound seemed to send him into an extreme state of apprehension. He was apparently unaware of the nature of his environment, and took no notice of questions addressed to him He frequently went through an elaborate pantomime in which he would stare in terrified fashion in front of him, suddenly point ahead, utter some disconnected remarks such as "Germans!" or "over the top!" then cover his face with his hands and fall back on the bed, or suddenly dive under the bed-clothes. The condition appeared to be a confusional psychosis with vivid auditory and visual hallucinations He was given gr. 1/75 of hyoscine and quietened down at once.

The theatricality of the performance was impressive from the outset For three days the condition was kept up, and it was noted that the crises occurred particularly when he was under observation When he considered himself unobserved the confusion and terror seemed to disappear, but recurred at once if he was approached. Suspicions had by this time been aroused as to the genuineness of the condition. He was taken into the medical officer's room and, under careful questioning, information was obtained from him which could not possibly have been given if he had been in the condition of confusion his pantomime indicated. Confronted with the situation, he broke down and confessed that on being sent back to the trenches after treatment for a previous attack of shell-shock in another hospital, he could not stand the sound of the guns, but relapsed on the first day, began to shake all over and was again sent down sick. He had two-and-a-half years' service in the army and had been in France for six months He described how about six weeks previously, while with his battalion, he had been sent out on patrol with a party in no-man's land. The enemy's artillery opened fire and the party were forced to lie on the ground with the shells bursting round them for about twenty minutes The patient stated that he did not remember any more until he woke up in a shell-shock hospital, very nervous and jumpy. After about five weeks' treatment he was sent back to duty, but on the first day with his regiment broke down, as described above, and decided to simulate a condition which he hoped would bring about his transfer to England. The patient stated that he had been recommended for a decoration for bravery in the field, and had in his possession a white divisional card for good conduct. He expressed his regret and put forward a request to be sent back to his battalion in the effort to make good.

CASE 2

A private soldier, aged 20, was admitted into hospital in July, 1917, and remained for about three weeks in a state of apparent delirium. He sat up in bed most of the day staring fixedly in front of him, to all appearance oblivious of his surroundings and failing to understand what was said to him. He muttered continuously and unintelligibly, the only word which could be distinguished being "mother." There was no sign of disorder of any of the systems and physically he was robust He could do practically nothing for himself, had to be led about, required to be spoon-fed and obtained a good deal of attention from the ward sister. It was noticed that when approached by the medical officer the rate of his pulse went up, his breathing increased considerably, he perspired freely and swallowed frequently.

These signs, combined with the unusual nature of the condition, aroused certain misgivings. One day, as he was sitting in a chair and being fed by the ward

* Based on a thesis presented for the M.D. at Edinburgh University

orderly, I stood in front of him and carefully watched the proceedings. After some time his breathing became more rapid, his pulse-rate increased, he began to show signs of agitation and his face flushed. It was a reaction difficult if not impossible to reconcile with a genuine condition. He was taken into the medical officer's room, soon broke down under examination, and confessed that he had become increasingly nervous in the line and had assumed a fictitious condition as a means of getting out of it. He was overcome with shame at the failure of his deception. He covered his face with his hands and said "What will the Sister think of me!" This difficulty was smoothed over for him, but it created a sensation in the ward when he walked out of the room a normal man again, and aroused no little bewilderment in the orderly who had been feeding him but a short while before.

CASE 7

Among malingerers loss of memory was fairly common, especially in the later stages of the war. With Alan Breck Stewart in 'Kidnapped' these cases might claim to have "a grand memory for forgetting."

Sergeant C was admitted into hospital in May, 1918, complaining of headache and loss of memory. He stated that he woke up in a field the day before and found that his memory was gone: the last recollection he had was of being on the docks at Karachi in August, 1914, waiting to embark for France. A definite localised amnesia seemed to be present extending over a period of nearly four years. He remembered all his early life before August, 1914, and was able to give a detailed account of it. From notes sent down with the patient there was no evidence of any initial period of confusion such as occurs as a rule in cases of extensive amnesia. In conversation he was alert and bright, accurately orientated and normally quick in reaction time. His mental state was investigated by the free association method (Jung, 1917). In this a series of test words is given and the reactions noted. A number of significant words were included, designed to reveal the concealed complex which would be present if the patient were malingering. Such critical words as "trick" and "deceive" might be expected, in these circumstances, to produce a special reaction, for example, lengthening of the reaction-time and perhaps an unusual form of association. The results of the experiment are shown in the table.

FREE ASSOCIATION TEST ON SERGEANT C

Stimulus word	Reaction	Time in seconds	Stimulus word	Reaction	Time in seconds
green	grass	1·6	explode	ball	4·5
hammer	nails	1·5	continue	game	4
whistle	train	1·5	danger	train	4·5
nut	Spain	7	tree	branches	3
smoke	fire	2·5	go	away	5
fill	box	2	beef	steak	1·5
terrible	terrible to lose memory	1·2	sentence	5 years	3
			river	flowing	1·5
			bat	ball	1
trick	cards	10	dislike	hate	3
burst	bottle	3·5	watch	time	1·5
pay	pay	10	penalty	imprison-ment	2·75
for	ever	1·2			
force	driving	2	point	upwards	2·5
pint	handker-chief	1·5	burn	finger	1
			eat	dinner	1·5
will	dead man	5	key	door	1·5
deceive	wrong	13			

In the absence of proper apparatus, times were recorded with an ordinary watch. I estimated the probable upper limit of normal reaction time under the circumstances to be 3 seconds and regarded as significantly lengthened all longer than this. I had used the method previously in similar experiments on patients with genuine amnesia and had found it to be helpful. In Sergeant C the number of *complex-indicators* was so abnormally great and the reaction-times were increased in such a large proportion of the associations that powerful psychological forces, either conscious or unconscious, were obviously present. In a control experiment with the same list of words on a patient with a slight injury, only one complex-indicator was found—namely, the word "sentence." Even if we assume that this man had an exceptionally rapid reaction time and regard a wait of 3 seconds as abnormal only four complex-indicators occurred in the list of thirty-one words.

More increase in the number of complex-indicators is not however, proof of simulation. Most cases of the war neuroses show the same phenomenon. But on further investigation by the free association method, additional evidence was brought to light. For example, when the patient was asked to associate to them, none of the critical words were found to lead to any complex. To each of them a number of apparently indifferent and innocent associations was produced. Very striking also was the prolonged delay which occurred with practically every association that he made. There was no obvious reason why a person quick in mental reactions at other times should show this abnormal retardation under test conditions. The obvious inference was that he was concealing his thoughts, and was not responding with the first word that came into his mind as he pretended to be doing.

The evidence of the association-test was significant but not conclusive. In the light of later developments it appeared to have had an additional value, for it gave the patient the impression that his deception had been penetrated. Perhaps as a result, he almost at once started to exaggerate his alleged mental impairment and coloured the condition rather highly. To impress on the medical officer the simplicity of his mind about the newer inventions of the war, he volunteered the information that another patient had been talking to him about tanks. He had never heard of them before and wondered what sort of things they were. He had seen many of them go past the hospitals on trains, he realised that they were like the old "caterpillars," but could not see how a tank moved along. In view of his capacity to apprehend other things equally difficult, this apparent impairment of understanding was obviously assumed. Other weapons of war such as gas aeroplanes and the submarine, he "didn't seem to understand it." He had been reading, he said, in the newspaper of the sinking of a liner. He had never before heard of torpedoes, and he could not understand how anything from under the water could sink a ship that size.

Probably a conviction was forming in his mind that the evidence of his trick was increasing and that his embellishments had not produced the desired effect. At all events, a few days later he reported that practically all his memories had returned, in the following circumstances. The day previously, while at dinner he said, a wasp was flying about and he got up from his seat to kill it. Some one remarked that a wasp's sting was worse when it was dead than when alive, and another sergeant who was present observed that he once saw a man stung on the thigh. He had no sooner said this than the recollection came back to the patient of lying wounded on the thigh by a piece of shrapnel in May, 1917; it felt just like a sting at the time. He then got up, he said, went into another room and lay down on his bed, and his memories came back one by one. All the circumstances leading up to his present condition returned to him. He remembered being at his battery and starting out to reach a certain village. A salvo of shells came over, he jumped into a trench, something hit him on the left side of the head and he lost consciousness. He came to himself about two hours later lying on his stomach in a field feeling dazed, and covered with dust. He thought he was at the docks at Karachi and expected to see the troops about him waiting to embark. He got up and walked about half a mile then he came

over faint and sat down. When he woke up again—he thought about an hour afterwards—he could not remember anything; his mind was a complete blank. He started to walk along a road when a soldier met him and the patient inquired where he was. The soldier asked what had happened to him and he replied that he did not know. The soldier then took him to a dressing station at F——, and when he sat down he began to vomit. He was asked what his name was but did not know, so they went through his pockets and took out an envelope. When the patient saw the envelope he remembered his name and address, and, in fact, all his memories then came back except the period between waiting for the boat at Karachi and his "coming to" in the field. He could not remember anything of his life between those dates, and he had remained in that condition until the day before, when the episode of the wasp took place. Now, he said, all his memories had returned, except, curiously enough, the fact that he could not remember the identity of a girl who had written to him some weeks before. He could not remember receiving the letter, he said, nor the person who wrote it.

It was a circumstantial, realistic and plausible tale, and at the end of it he said he wished to express his thanks for the treatment. The story proved, however, to be almost completely fictitious. The following morning he confessed that the loss of memory had not been genuine. He had for some time been feeling increasingly nervous in the line and, in addition, relations had become greatly strained between him and the officer of his unit. On the day when he started for the village, shells came over and he got frightened and ran. He was not hit in the head, did not lose consciousness or lose his memory and the incident of the envelope which he had described was an invention. He met a soldier who took him to a dressing station, where he was so frightened that at first he could not give his name. He calmed down shortly afterwards, and as he found he was being sent to hospital he decided to keep up the deception.

CASE 4

Another case of apparent amnesia was that of a soldier who was sent into hospital in July, 1917, as the unidentified man. He had a gun-shot wound of the right hand, the middle finger of which had been amputated. He had been found, about six weeks before, wandering in a village not far from the trenches with the wound in his hand, and was taken to an advanced dressing station. There it was discovered that he had complete loss of memory for the whole of his past life. No information could be obtained from him regarding his name, regiment, home, or any of the details of his life. He did not know, for example, if he were a married man, if his parents were alive, or what was his former occupation. He had no identity-disc, pay-book or other means of identification on his person, and the following day he was sent to a casualty clearing station as an unidentified man. In the latter hospital after representatives from the surrounding regiments had failed to identify him, an attempt was made to obtain some information from him as he was going under and coming out of an anæsthetic, but without result. He remained there five or six weeks obtaining treatment for the wound and making himself useful in the ward.

When examined, he was found to be a bright, cheerful individual, clear in mind, able to understand perfectly what was said to him, and normally quick in reaction-time. He stated that he remembered everything since coming to at the advanced dressing station, but nothing of his life before that time. He could not read nor write, and was unable to name a letter of the alphabet written on paper before him. He declared that he could distinguish between what was writing and what was not writing. He had been in this condition since the time he found himself in the advanced dressing station about six weeks previously. There had apparently been no confusion at the dressing station and certainly not at the casualty clearing station the following day. There was no childishness of manner as was seen in many genuine cases of complete amnesia. His attitude was that of a normal grown man. He was sensible and rational in his conversation and he had no difficulty in apprehending what was said to him. There was no loss of the power to name objects, although, as already noted, he was unable to name the letters of the alphabet. He was capable of counting up to twenty-one, because he had helped the sister in the casualty clearing station who had twenty-one beds in her ward. Beyond twenty-one, however, he was unable to go. He showed no anxiety about his condition, accepted his severe disability with apparent indifference, and displayed no keenness or enthusiasm in filling-in the gaps of memory.

The condition was investigated along the lines described in the last case and within a few days his façade gave way and he confessed the imposture. He stated that he left his regiment when in billets and went up towards the trenches. He had had bad news about his wife and was feeling very worried and depressed. He intended, he said, to do away with himself and meant the shot which injured his hand for his head. When he fired and saw what he had done he "sort of came to himself" and realising the seriousness of his position threw away his pay-book and other means of identification. On being taken to the dressing station and asked his name he said that he did not know. As he found the deception was successful, he maintained it.

CASE 5

The varied symptomatology of the war neuroses made one speculate as to a possible relation between the strain of life in the trenches and the occurrence of a paranoid state with delusions of persecution. Theoretically it was not difficult to imagine a causal connexion and it was, therefore, a matter of considerable interest when the following case was sent into hospital in the beginning of September, 1918.

The patient, a private aged 22, was apparently very apprehensive. When brought into the medical officer's room he held up his finger, glanced over his shoulder and said "Hush!" He then leant forward and, in a whisper, said: "He keeps following me . . . Jerry; . . . all over the show . . with rosary beads round his neck . . . a big man . . . with black hair and beard and a yellow face." The patient would not speak above a whisper, because, he said, "he'll hear me." In fragments the history was obtained from him. He had gone "over the top" some days before with his battalion and taken the objective. He saw a great many dead Germans including the one who was following him about, who, he said, was strangled by rosary beads round his neck. The following morning they were relieved and went back to the reserve trenches. Two days later, when on their way up to the front line again, the patient said he felt that the German was following him. He turned round, saw the man behind him, and fell down in a state of terror. The German, he said, wanted to get his revenge as he (the patient) had killed a lot of his compatriots with bombs, "hundreds of times on raids." The history was extracted from him with some difficulty, and was accompanied by much screwing up of his face and pointing with his finger in the effort to remember. He frequently interrupted his story with such remarks as "I must go back," and "May I go back?" which seemed inconsistent with a genuine condition of extreme apprehension. On being examined, he would not close his eyes for the rhomberg test, as, he said, "he'll get me." The exaggerated and inconsistent features of the condition led to doubts of its authenticity and a pointed hint was given to him. The same evening he stated that he was much improved. The following morning he reported that the German had disappeared and thereafter left him in peace.

CASE 6

The detection of malingering was sometimes made easy by patients, who aspired too high in their flights of fancy It is probable, however, that other cases occurred which were never exposed, and from time to time dubious conditions were seen in which an assured diagnosis could not be made

A case in point was that of a man admitted to hospital in a condition generally resembling a psychosis His conduct was childish and silly He gave no real trouble, was clean in habits and enjoyed his food, but was untidy in his person and perverse in trivial matters Certain features suggested that auditory hallucinations were present and that dementia præcox was the probable diagnosis There were, however, other features with which this diagnosis could not be reconciled The following fragment of dialogue is the record of an actual conversation which took place with the patient, and is typical of the only kind of conversation that could be elicited from him

Medical Officer How are you getting on now ? Take the match out of your mouth How are you getting on ?—Patient Champion, sir

M O : Better than you were yesterday ?—P Champion, sir

M O Why do you keep your eyes closed ?—P What you were saying, sir

M O What did I say ?—P The same thing, sir

M O What do you mean by that ?—P Got it, sir

M O What have you got ?—P That

M O What's "that" ?—P Ingersoll watch

M O Why do you make gestures like that ?—P Because they are better ones than those ones

M O What are "those ones" ?—P These ones

M O What ?—P Those ones

M O What do you mean by that ?—(No answer)

M O What do those gestures mean ?—P Life, sir

M O What's that ?—P Polar bear, sir

M O Why are you stretching out your hands ?—P My power, sir

M O What power ?—P What you said, sir

M O Why do you make those faces ?—P Très bon, sir They are champion sir Très bon Looks champion sir

M O : What looks champion ?—P Ah ! Très bon, New ones

M O New what ?—P Boots sir What time is it now, sir ?

M O What time do you think it is ?—P I think it's about one o'clock, sir Do you mean that, yes ? Take it then

Even after the case had been under observation for several weeks, no definite decision as to the nature of the condition could be arrived at and he was evacuated to the Base

The main difficulty at our advanced centre was the lack of psychiatrically trained medical staff A further drawback was that in the different phases of the war the numbers of patients varied considerably, during a push we were often swamped with new cases At these rush times, it is probable that a number of malingerers escaped our vigilance and were evacuated to the Base along with the severe cases It is essential that medical officers at advanced centres should bear the question of malingering constantly in mind At the same time, even in spite of psychiatric experience the diagnosis may be extremely difficult, as has been shown above If injustices are to be avoided, and unnecessary compensation and pensions saved it is essential not only that diagnostic psychiatrists should be available, but also that facilities for observation as long as may be necessary should be at hand

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PROFESSIONAL EXAMINATIONS

THIS AUTUMN

ENGLISH CONJOINT BOARD

In consequence of the outbreak of war the committee of management of the Examining Board in England has authorised the following arrangements and modifications in the regulations for the L R C P, M R C S Section 1 of the final (pathology and bacteriology) will be discontinued Candidates who have already passed section 2 (medicine, surgery and midwifery) should inform the secretary of the board of the date on which they passed in the last subject Arrangements will then be made for their names to be submitted to the Royal Colleges, so that they may be granted the diplomas of L R C P, M R C S Candidates for the final qualifying examination will be allowed to complete the examination on producing evidence of having done thirty months' clinical work after passing in anatomy and physiology, provided that all the specified appointments have been held Candidates who have done twenty-four months' clinical work after passing in anatomy and physiology will be eligible for admission to one or two subjects of the examination The regulation requiring the whole of the final examination to be completed within a period of twenty five months is suspended

It is anticipated that the first examination (anatomy, physiology, materia medica and pharmacology) will begin on or about Wednesday, Oct 18 Candidates will be eligible for admission to part I (anatomy and physiology) on producing evidence of forty-six weeks' study in anatomy—including dissection of the entire cadaver—and physiology, all of which may be completed within a period of twelve consecutive months Owing to the postponement of the examination, entries will be accepted up to the first post on Wednesday, Sept 27

It is expected that the premedical examination (chemistry, physics and biology) will begin on or about Monday, Oct 23 Further particulars of the first and premedical examinations will be sent to candidates as soon as they are available

The examinations for the Diplomas in Child Health and Public Health due to begin in September and October respectively are postponed for the present Further information will be published as soon as it is available

Candidates for all examinations must be prepared to be examined outside London if necessary

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The final examination for the Fellowship will, it is expected, begin on Nov 9 and the primary examination on Dec 4 as advertised

The final examination for the L D S will it is expected, begin on Oct 27 as advertised The first examination for the licence, advertised to begin on Sept 20, is postponed for the present

Candidates who enter for the examinations by the appointed dates will be sent further particulars when arrangements have been completed

SOCIETY OF APOTHECARIES OF LONDON

The examinations conducted by the society will as far as possible, be continued under existing regulations, but the following modifications are announced

The premedical examination in science will be discontinued for the present Examinations of other boards which admit successful candidates to registration as medical students will be accepted as usual

For the primary examination evidence of a period of forty-six weeks study in anatomy and physiology, which may run concurrently, will be accepted in lieu of the five terms laid down in the regulations

Students will be allowed to complete the final examination on showing evidence that they have held all specified appointments and completed a minimum of thirty months clinical work after passing anatomy

and physiology, and will be admitted to one or two subjects of the examination on the completion of twenty-four months of such study. The regulations which demand the completion of the final examination within a period of twenty-five months will be held in abeyance The hours at which examinations are held will be regulated as far as possible to ensure completion during daylight. candidates should note carefully the times of attendance indicated on their cards of admission.

PUBLIC HEALTH

Health-Instruction Officers

BEFORE the outbreak of war the Nottingham county council were considering the appointment of a health officer to coördinate instruction of the community Such officers are not uncommon in the United States, but so far we have had none in this country, though we have many unofficial health instructors, from newspaper correspondents to public lecturers, and health teaching is one of the cardinal duties of every health officer

The chief work of a health-instruction officer is to retail physiological sciences to the community in a form which the public can digest, but in addition he should be able to translate research into terms of action for the benefit of health officers The Medical Research Council, the Industrial Health Research Board and all other bodies and persons engaged in furthering the science of medicine complain bitterly and frequently that the goods they deliver are not utilised and that discoveries with wide possibilities of practical expression lie on the table for months or years—often until they are forgotten. Nobody can be blamed for this, for the language of research is not that of medical practice, the language of medicine is not that of the people, and there is no interpreter.

Notts county were prepared to consider appointing a health-instruction officer if a suitable candidate could be obtained, but doubt was expressed whether any was forthcoming. In our issue of July 22 we published an address by Dr Iago Galdston of the New York Academy of Medicine, entitled The Health Educator, which gives a clear view of what such a person should be and how he should act From this it is obvious that efficient public health instructors will not be obtainable easily, for those possessing all the necessary attributes can command high places in numerous branches of industry, but in a peaceful world in which the object of governance is the prosperity and happiness of the peoples, the position of health instructor would be highly attractive to persons of superior wisdom

Medicine for Evacuated Children

Correspondence has passed between the Ministry of Health and the organisations representing pharmacists concerning the supply of medicines for unaccompanied children who have been evacuated under the permanent scheme It would seem that in making provisional arrangements with the Central Emergency Committee for medical attendance on such children, including the supply of medicines, the Pharmaceutical Emergency Committee was not consulted The Minister of Health has now explained that it is not proposed that payments to doctors should be made at a capitation rate; in fact it seems doubtful whether such a basis could be adopted in view of the uncertainty of the duration of the stay of each child The Ministry's proposal is that the amount to be allocated by the Government for each reception area, although calculated in the first instance at a flat rate of 10 shillings a head, should be handed over to the local medical emergency committee, who will evolve their own scheme for remunerating the doctors either on the basis of payment per visit or such other basis as they may consider appropriate The Ministry, in a communication to the secretary of the National Pharmaceutical Union, says "the doctors will doubtless follow their normal practice in the matter of supplying medicines or giving prescriptions, and in either case the cost will be met out of the local pool" The Ministry understands that in some areas doctors who are not accustomed to dispensing have expressed a wish to be allowed to give prescriptions which could be dispensed by any chemist. Although the children are not insured persons the Ministry is prepared to agree that the pricing bureau under the National Health Insurance scheme may be used for the purpose of allocating payments to the chemists in respect of medicines so supplied. It would be well if the local medical and pharmaceutical committees were able to agree on terms which will make for the smooth working of this emergency scheme.

The Weekly Return

In his weekly return (*1939, no 36*) the Registrar-General points out that the return of deaths relates to civilians only—i.e., it excludes the deaths of serving sailors, soldiers and airmen The births and deaths assigned to towns or other areal divisions of England and Wales are those actually occurring in the respective areas without regard to or adjustment for usual residence Furthermore, owing to the partial evacuation of populations from London and some of the large towns, the weekly birth- and death-rates cannot be calculated with accuracy and are discontinued for the present The estimated populations at the middle of 1938 (given in table 1) no longer correspond even approximately with the deaths in that table for many towns, but being the latest available estimates of the populations normally resident therein they are still included

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 9, 1939

Notifications.—The following cases of infectious disease were notified during the week Smallpox, 0; scarlet fever, 1106; diphtheria, 782; enteric fever, 77; pneumonia (primary or influenzal), 237, puerperal pyrexia, 166; cerebrospinal fever, 10; poliomyelitis, 30; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 19; ophthalmia neonatorum, 78 No case of cholera, plague or typhus fever was notified during the week

Deaths.—In 126 great towns, including London, there was no death from smallpox or scarlet fever, 2 (0) from enteric fever, 2 (0) from measles, 8 (2) from whooping-cough, 19 (0) from diphtheria, 43 (1) from diarrhœa and enteritis under two years, and 5 (1) from influenza. The figures in parentheses are those for London itself.

Ilford and Gillingham each reported a death from typhoid Wolverhampton had 2 deaths from measles, Birmingham 3 deaths from whooping-cough Fatal cases of diphtheria were scattered over 13 great towns, Sheffield reporting 3, St Helens, Walsall and Plymouth each 2. Liverpool had 7 deaths from diarrhœa, Hull and Wolverhampton each 3

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations Each contributor is responsible for the section for a month, his name can be seen later in the half-yearly index

FROM D P M

IV

How are we going to fill in our spare time while Mr Chamberlain and his colleagues are polishing off the Nazi regime? That is what institution dwellers are asking themselves at the moment Herodotus records that during a shortage of corn the Lydians invented games, they had games all one day and *no dinner, and the next day they had dinner but no* games He *mentions* dice ball, *and* bucklebones among their inventions and adds that in fact they thought of all the games except draughts—which looks as though we have to thank the Lydians for snakes-and-ladders and ludo However after eighteen years even the Lydians got tired of this arrangement, so they drew lots and half of them moved out, leaving presumably, a daily dinner for all So much for the Lydians, as Herodotus would say, and as we may fairly hope for dinner as well as games we ought to be able to last out twice as long as they did

The problem is not really frivolous Nurses come off duty at seven in the evening, by eight it is dark, and soon they will have no daylight off duty time at all London, after dark though perhaps not a wicked city at present, is certainly a dangerous one, as those who drive by night know Many nurses wisely stay in the hospital, though now that the cinemas are open again they will have more occasion to risk their limbs Still they cannot spend all their free time in cinemas, and there is little enough to occupy it in hospital It would be a good opportunity for study had not even the mild excitement of the R M P A examination been taken from them Nurses who have no practical use for the information sit like a row of unresponsive muffins before the sweating lecturer I can't seem to take any interest in this stuff now," one willing girl said sadly

This interruption of education is, I suppose inevitable, or is it? Have we perhaps overshot the mark again and been too careful? In the last war we certainly rushed a large number of nurses and doctors through their examinations in order to avoid a shortage, and perhaps this meant that the standard in the two professions fell a little—at least as far as theory went, practical experience was probably wide enough to outweigh this defect The standard is just as likely to fall and to fall heavily it seems to me under the present system If medical students and probationer nurses are to be kept in a state of suspended education for any length of time their enthusiasm is likely to evaporate The Conjoint Board, with engaging phlegm is carrying on with its examinations, perhaps we can hope that most of the other examining bodies will presently pluck up spirit to do likewise

* * *

Common usage is said to be the final criterion in settling the meaning of a word, but the fate of the word 'evacuate' at the hands of the common user, and even of the B B C calls for a mild protest at the present time I can see that it is possible to evacuate London but is it really possible to evacuate a child—except by catharsis?

Anyhow, in one village they were waiting for their quota of these evacuated children, buns chocolate and bumpers of milk, designed I suppose to fill the vacuum, were laid out in the local school room, and the matrons of the village had collected to welcome the little ones Night fell and the matrons went home Next day they came again, and the day after, but no children appeared The milk had to be replaced, the buns got stale, and the less conscientious matrons began to nibble at the chocolate, now a little dusty In the early days of the vigil speculation on the appearance of the children ran high, for each matron had applied for a blonde, blue eyed female child aged five, and had expressed her determination not to be put off with a healthy boy of eleven or so with muddy boots However, as the days went by decision faltered, and it was generally felt that the sight of any sort of child would make a welcome change Finally word came that each of the neighbouring villages had double its quota of children, but that their own village had been overlooked, and owing to some regulation or other it was impossible to switch the excess children over into the empty village

This story rather cheered me, as it looks as though we may be muddling along in the same old way after all

* * *

I have just been hearing *some facts* new to me, about ancient weapons of war They seem encouraging Most of us are inclined, I think, to compare modern warfare gloomily with the home made efforts of our forbears in the belief that we can now kill more people more cheaply, quickly and disagreeably than they could However, as so often happens with scientific advances we turn out not to have been very clever after all The six foot longbow, I am told used by an expert loosed a clothyard arrow with a force of anything up to a hundred and fifty pounds, capable of piercing steel armour like cheese, more over being barbed and spinning it made a wound more commonly mortal than not The knight hit by an arrow observed the rules of battle and gave no more trouble to the enemy that day, and even a charging lion is said to be stopped more certainly by an arrow than a rifle bullet Bullets indeed move faster than arrows but are not mortal unless they hit you in one of the right places

Then again, the method of joining battle in the past made for a high mortality rate, you picked out some fellow on the opposite side and went on fighting him until one of you lay down Thus ensured a fifty per cent mortality in every single combat, with a chance of raising the figure to a hundred per cent by the time the army surgeon had done with the victor These would be regarded as impossibly high figures in modern war I recall one of *The Lancet* staff telling me that whenever he read about the pessimists going out armed 'only with hills' his sympathy was strongly with the enemy Clearly they would be less dangerous if armed only with machine guns which require an expert to use them

And finally civilians may recall for their comfort that when our forefathers took a town they sacked it, and sacking was sacking in those days, there was no talk about sparing the women and children or respecting the Red Cross or anything of that kind They made the party as unpleasant as possible, and

it was the more unpleasant to my mind because it was held at close quarters Death was not sprayed impersonally from the air; you saw your fellow man drunk and distorted and mad, carrying out deeds which would be dreadful to him ever after How much more agreeable to receive a bomb through the roof of your own home as you sit among your family doing the evening cross-word And in any case the chances of being hit are far smaller than the chances of not being hit, while the chances of escaping attention during the sack of a city must have been poor. In fact if we can put up with the bangs we shall have very little to complain of, thanks to the march of science.

* * *

A Spanish girl who has been watching the air-raid precautions in one of the outlying shires cannot get over her amusement at our concern for ourselves The Spaniards carried their war, it seems, with a lighter touch, they popped into the local cinema on their way out of a crumbling town, and when they used gumstrip they used it coloured, and stuck it on their windows in fancy patterns So far I have seen no advance on the Union Jack in window decoration over here, it makes one feel rather shamefaced "Surely," someone said to me the other day, "this is not the way that England used to go to war?"

No, this is a new way, certainly; and of course in some respects a better one There is no cant, no cheering and no chat about glory this time, for which we must all be thankful, but on the other hand there is this dreadful solemnity, as though we thought we mattered It makes one wonder how we became so inflexible, and whether invasion by a lot of total strangers would be quite the disaster we all imagine Though heaven forbid it should be a German invasion: the Germans are too much like ourselves in being willing to submit meekly to a mass of regulations What we want is a change, and I can't help thinking it would do us no harm to be invaded by the French, they have such a good sense of values and are not preoccupied by the trivial in government It is nearly a thousand years since the last French invasion of this country, and the old Anglo-Saxon has got the upper hand again How the Normans must have enjoyed upsetting the old English customs, shocking the local dignitaries and bringing their vulgar candid wit to bear on Anglo-Saxon politics The trouble is, however, that if people live long enough in England they become English, I think it must be something to do with the climate,- they become—roughly speaking, of course—rather grave and sentimental, with a simple faith in British institutions At the moment our simple faith seems to have got the better of our Norman blood, and it has not needed a war to bring this unfortunate fact to light We have been growing too well-regulated for a long time now, multiplying restrictions on eating, drinking, smoking, parking and crossing the road until we expect to be told how to carry out the most elementary processes. I remember once being asked—not by *The Lancet*—to write an article on "How to Breathe"

Our chances of a French invasion are of course rather slight at present, but the strain we inherit from that race of brilliant realists should help us to shake off our present mood of fussiness, or what is to become of the famous "sangfroid habituel" which the schoolboy had trouble in translating?

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

REGIONAL OBSTETRICAL SCHEME

THE Department of Health for Scotland has organised a regional obstetrical service for areas distant from the large hospital centres Obstetrical consultants have been appointed to organise and run hospitals in Dumfries, Inverness and Perthshire. The service is designed as a war-time measure for the care of pregnant women who have been evacuated from the danger areas of Edinburgh, Glasgow, Clydebank, Rosyth and Dundee, in addition to those already living in the reception areas In peace-time pregnant women have when necessary been sent to the large hospital centres, or consultants have travelled from these centres to the smaller towns In war-time, however, transport of either patients or doctors is difficult or impossible, and further the local practitioners are already overworked owing to the depletion of their numbers Hence the need for the new scheme The Dumfries service is designed to cover not only the town but also the counties of Dumfries, Kirkcudbright and Wigtown; because of the difficulty of reaching the patients' homes as many as possible will be brought in to the regional centre for delivery. Antenatal clinics will probably be set up in several smaller centres Dr J Bruce Dewar has been appointed for whole-time work in Dumfries, Dr Caroline Elliot for Perthshire, and Dr. T. N. MacGregor for Inverness.

MEDICAL EXAMINATION OF EVACUATED CHILDREN

Many complaints have been received from reception areas about evacuated children having been sent without adequate medical examination. The inevitable cases of infectious diseases have cropped up, but the chief complaints have been of scabies, pediculosis, ringworm and impetigo Householders have stated that bedding and furnishings have had to be burnt Taking the evacuation as a whole, these are minor if unpleasant worries and they must be put down largely to the suddenness of the exodus and the time that Hitler chose—just at the end of a long holiday before the school medical authorities had an opportunity to examine the children Further evacuation is only likely to be carried out in small groups, and assurances have been given that the children will be examined and their equipment attended to before they leave their home towns.

CERTIFICATION OF DEATHS

SPECIAL arrangements have now come into force for the certification of deaths due to war operations. Bodies not claimed by relatives will be taken to a mortuary, and the clerk to the council will send the registrar a certificate that death was due to war operations. In the case of serving sailors, soldiers or airmen, and of certain classes of civilians employed with the armed forces, commanding officers are authorised to issue a certificate. The ordinary procedure will apply to other deaths. A medical practitioner who was in attendance on a deceased person prior to death should issue an ordinary death certificate and should add the words "war operations" to the particulars of violence. When no doctor has been in attendance before death the relatives may request one to inspect the body and issue a certificate and if he is satisfied that death was due to war operations, he may do so. He should complete the ordinary certificate, deleting the words "last seen alive by me" and "not seen," thus indicating that the deceased was seen after death but not before Whether the doctor has been in attendance or not there will be no need to report these deaths to the coroner and no inquests will be held on them.

LETTERS TO THE EDITOR

THE WAR AND THE R M B F

SIR,—In spite of the unprecedented difficulties which members of the medical profession are experiencing owing to the war, may I appeal through you, Sir, to all our regular subscribers, who have not yet sent in their contributions to the fund for the current year, to do so now or as soon as possible If we are to do our part, as the profession will expect us to do, in continuing to help our aged beneficiaries, and also those who may suffer privation owing to the war, it is vital that we should receive financial support not only from our regular subscribers but from every member of the profession

Cheques should be made payable to the Royal Medical Benevolent Fund and sent to Wormingford Grove, Wormingford, Essex

I am, Sir, yours faithfully,

LEWIS G GLOVER
hon treasurer

Sept 18

MEDICAL CARE OF CHILDREN IN THE RECEPTION AREAS

SIR,—Since we have evacuated children from our larger cities to save them, if possible, from the risk of bombs, we needs must act quickly to minimise the possible toll of disease To organise the medical services of the nation in face of this vast dislocation of the life of the people was a superhuman task So far the bombs have not descended on us May we take advantage of this breathing space to deal with some of the more obvious gaps in our medical arrangements? Of these, one is certainly medical provision for children in the reception areas, another (with which I am not concerned in this letter) is provision for children in London, where thousands of children remain Let alone the risk of epidemics in rural areas resulting from the mass migration of children, we need to bear in mind that the children are of necessity often billeted in the houses of persons with scant knowledge of children, healthy or sick, and also that scattered in country districts are many hundreds, nay thousands, of infants and children who, but for the war, would be inpatients in city hospitals or under skilled supervision in outpatient clinics Moreover, mothers of artificially fed babies in country districts are likely often to be unable to get the particular dried milk or infant food with which they are familiar—a small point one would say, but infants may quickly come to grievous harm from want of some elementary instruction in feeding

It is said that some mothers are bringing sick children back to London because they hope thus to get the medical help to which they are accustomed, and children with minor infections have in some instances been sent back to London by local authorities for treatment There is at present not only a shortage of medical help in rural areas, but the health visitors and school nurses of London who would normally be concerned with the welfare of the children have been drafted to other work in first aid posts and hospitals

Presumably the authorities will aim at providing in the reception areas

(1) Clinics for infants and children of all ages at which advice will be given and minor conditions treated

(2) Clinics with facilities for laboratory and other investigations

(3) Inpatient accommodation with full hospital facilities

(4) Beds for sick children unlikely to require more than simple nursing and medical supervision

(5) Beds for infectious diseases

(6) Treatment by general practitioners

Of arrangements to provide (1) to (5) I know nothing, except that in one sector a paediatrician has been appointed to take charge of thirty odd beds for children (when these are available) and presumably to start clinics, (6) must of necessity take some time to organise Meanwhile so far as I gather most London paediatricians are unemployed, whether they are sitting at home or are called up to act as general physicians at empty base hospitals Cannot they be utilised at once in their own sphere, to set up what we may call paediatric units in the various sectors or other reception areas and to form the skeleton of the required services other than the general practitioner service?

To begin with they might institute clinics, some in village halls, some at hospitals, some perhaps in empty houses which might eventually form small hospital units on the model of school sanatoria Their services would be available when epidemics appeared in schools On such beginnings a more adequate medical provision could be built up Each paediatric unit might consist of the paediatricians allotted to the sector or county, a central dispensary and store, and a central laboratory or a share in such a laboratory A travelling dispensary van and dispenser would be an asset As the scheme developed the help of an orthopaedic surgeon, psychiatrist or other specialists might be enlisted, or existing orthopaedic clinics would no doubt assist Naturally the whole of the work would have to be coördinated with that of the medical officer of health and the local medical emergency committee Beds for sick children (both in fully equipped hospitals and probably in small groups in villages) are likely to be required on a fairly large scale, as temporary hosts will often be unable or unwilling to accept the responsibility of a sick child, and the paediatric unit should be available to give help when needed for any such beds

Our health services for children in peace time have suffered from the divorce between hospitals (voluntary and municipal), school medical service, child-welfare service and general practitioner service May this prove an opportunity for linking up some of our work for child health in the reception areas

I am, Sir, yours faithfully,

HELEN M M MACKAY

London, Sept 18

MONOCYTIC ANGINA?

SIR,—I have read with interest the account of a case of monocytic angina treated with M & B 693, recorded by Drs Hugh Stannus and Marshall Findlay in your issue of Sept 9 The prime interest of their case lies, of course, in the transmission of the infection to the rhesus monkey as a further step in the ætiological investigation of the disease But they also stress the dramatic—this overworked word must still be used for many results of sulphonamide therapy—cure brought about by M & B 693, though they point out that the action of the drug may only be on the secondary throat invaders For a striking feature of some cases of monocytic angina is the late period of onset of a severe throat lesion which does suggest a secondary invasion of weakened tissues I have recently had under my care a typical example of this disease, similar in most respects to that described by Stannus and Findlay A large mass of glands in the right side of the neck, developing a week before the severe tonsillar infection gave an early clue to the diagnosis and suggested the advisability of a blood-examination the latter revealed a marked increase

in the mononuclear cells Eventually the throat condition became much worse, with temperatures up to 104° F., and the patient appeared very ill indeed. Treatment with M & B. 693 orally in full doses was instituted at this stage, and the clinical picture completely changed in 24 hours

Monocytic angina is a strange clinical syndrome, presenting varying pictures The prodromal symptoms are vague malaise, headache which is often severe, slight pyrexia, occasionally epistaxis, and usually a slight soreness of the throat The diagnosis can hardly be suspected until the adenopathy appears, and it is obvious that a correct diagnosis must often fail to be made; many cases, I imagine, are labelled Vincent's angina, since the textbooks state that severe throat involvement is rare in monocytic angina. But the appearance of the cervical adenopathy *before* the throat signs or symptoms are at all conspicuous should suggest immediate examination of the blood

I fear that before very long the precise diagnosis will have only an academic interest, for who can resist giving a sulphonamide derivative to the non-diphtheritic "throat"? No thoughtful clinician likes to see his obscure pyrexia cured by hit-or-miss therapy before he has arrived at a diagnosis, provided his patient is not deteriorating, but this academic catastrophe must be happening every day with a drug so wide in its therapeutic actions as M & B. 693. However, we are gradually learning what infective processes are not aborted by the drug, and thus its exhibition is coming to have a value in diagnosis, as well as in treatment

I am, Sir, yours faithfully,

Liverpool, Sept 11. RONALD ELLIS.

REGIONAL ORGANISATION

SIR,—War will probably make a national medical service a necessity Those who have desired and worked for this in peace-time may now have an important duty. Opposition has been based on two fears, firstly of bureaucracy, secondly of financial loss by some individuals The second will no longer count for much if, as one hopes, some method is found of ensuring that inevitable reductions in standards of living are fairly distributed (it would be shameful if the heaviest losses were suffered by the families of those whose lives were at greatest risk on active service and war were made a source of profit to others) Paradoxically, peace-time advocates of a comprehensive service who saw the risks of administrative bureaucracy and tried to avoid them in their plans are likely to see their former opponents accept any sort of regimentation without demur now that their patriotism is obviously involved. Conscription of doctors is a necessity, but authoritarian organisation is not Regional organisation based on hospital and public-health centres will almost certainly develop; such centres should have the greatest possible degree of local autonomy on a representative basis, and acting medical staffs of all grades should have both a consultative function in policy and the greatest possible freedom of individual professional action The war committees of the British Medical Association, which are representative of the profession, should be able to play a critical part in ensuring that the principle of freedom of professional conduct is upheld as strongly as necessity allows, and that place-seeking nepotism and arbitrary exercise of authority are reduced to a minimum.

I am, Sir, yours faithfully,

B LEYS,
Consulting Physician Royal Northern Infirmary and Highlands and Islands Medical Service

Sept. 13

PREVENTING VACCINATION SEQUELÆ

SIR,—At the present time large numbers of persons will necessarily be vaccinated I would stress the importance of disinfecting the pustular mass on the sixth day after vaccination with potassium-permanganate compresses. The results of such compresses are first and least important a black scab, secondly a material reduction in discomfort, and thirdly a considerable lessening of septic sequelæ By experiment it has been shown that if a subject be vaccinated daily, on the fourth or fifth day the vaccination ceases to take, also if the vaccination area be excised on the fifth day subsequent vaccination does not take Vaccinal immunity is therefore established on the fourth or fifth day, and nothing is lost by disinfection of the vaccinal area on the sixth day The advantage of so doing is substantial The technique is really an extension from the well-known treatment of smallpox with potassium-permanganate baths

I am, Sir, yours faithfully,

West Wickham, Kent, Sept 9 R W JAMESON.

A WAR-TIME PHARMACOPŒIA?

SIR,—Mr. Davis suggests that a war emergency pharmacopœia should *now* be devised It may be useful for it to be known that machinery was set up some time ago and plans are already well advanced for the production of a revision of the British Pharmacopœia This will include substitutes for many foreign proprietaries in common use which can equally well be produced in this country once the patent and trade-mark rights on them have lapsed It can be confidently anticipated that the Board of Trade will cancel certain foreign patent and trade-mark rights, as was done in the last war, and there is no doubt that the machinery of the General Medical Council, which is already in being, will be able to introduce these substitutes with very little delay should it become necessary to do so The G.M.C. will also give, as they did in the last war, attention to the conservation of supplies of essential items of materia medica and the eradication of non-essentials The Ministry of Health have also been giving attention to the conservation of supplies of essential drugs

Regarding formularies, it will be appreciated that the existing pharmacopœias of some of our larger hospitals are specifically designed to combine the greatest economy compatible with the maximum therapeutic efficiency. The National Formulary also follows these lines to some extent, although further economies could probably be effected. In the meantime, however, medical practitioners could give invaluable assistance by adhering strictly to published formulæ and by refraining from prescribing proprietary articles, particularly those of foreign origin.

I am, Sir, yours faithfully,

JAMES COUTTS,
Sept. 16 Pharmacist to St Bartholomew's Hospital.

MALARIA THERAPY CENTRE AT HORTON

SIR,—Of recent years many cases of neurosyphilis have been treated by malaria therapy in the London general hospitals Those facilities for treatment no longer exist I am writing to say that the Ministry of Health, in conjunction with the London County Council, have made arrangements for the malaria therapy centre at Horton Hospital, Epsom, to continue Accommodation can be provided for private patients (at an inclusive cost of 4 guineas a week), voluntary and certified patients All rate-aided patients should have a London settlement Inquiries regarding possible admission should be addressed

in the first instance to the M O in charge of Malaria Therapy Centre Horton Hospital Epsom from whom the necessary application forms for admission can be obtained (Telephone number Epsom 9872)

I am, sir yours faithfully

W W NICOL
Medical Superintendent Horton Hospital

Epsom Surrey Sept 18

THE BLACK-OUT HABIT AND STALENESS

SIR,—We must all do our best to make the black-out effective for its purpose The Prime Minister says that the restrictions are required on strategic grounds and are the result of long experiments by the R A F They are for the moment inevitable', "preparations for blacking out at the last minute would be too late", 'lighting in remote areas would be a signpost to built up areas" Changes cannot easily be made 'until actual air raid experience' has been gained At the same time we have already some relaxation as to hand torches and masks for headlamps

It seems to me most important that the black out should still be under day to day consideration and should even be subjected to further experiments by the R.A.F The state of affairs in the sky must not be divorced from that on the ground Living in a country district I am perhaps naturally more concerned with the latter at the moment With short days approaching, a certain amount of transport must move after dark For instance our food comes entirely from a big London stores at present on five days a week in future on two Can their staff complete their round in two fifths of the time without risk of breakdown in health of the drivers if the strain of moving after dark is substantial' Similarly, even doctors perform their essential duties' Special care is now needed by day and night on the roads owing to the increase of bicycles in my locality they are sold out There are an additional difficulty to motor drivers Children must somehow or other be fetched from schools Schools will probably close early but my children have to go 5 miles and with reduced train and bus services and a walk of 2 miles at one end and 1½ miles at the other it is going to be a hard job to get them home before dark

At first sight it seems sound sense to tell people to keep off the roads unless they have urgent errands But the morale of the population must be maintained, and people can hardly be expected to be kept in isolation indefinitely from friends relatives and entertainments after the day's work. Some evening family meetings for bridge or even gossip will ease the difficulties of economising in fuel and light (you come to me once a week and vice versa).

I suppose it is impossible to give the harassed householder any standards If he has darkish curtains no shaft of light shows at, say 10 yards you could tell the room was alight behind the curtains but not at 30 Does this really matter' The evenings have to be passed somehow and many people are now trying to read and sew by inefficient light

There is still another point which demands consideration No doubt it was imperative to make householders and the users of cars expert in the prophylactic measures necessary in an air raid but that knowledge having been inculcated (and incidentally all the more light hearted traffic having been ruled out of the running) is there not a risk that the maintenance of strict precautions over a long waiting period will defeat its own end? Will not slackness and carelessness arise? And would it not now be better to relax the code to the understanding that it is instantly and automatically applied in the face of danger' Habit and fatigue are not subjects new to the industrial psychologist Is it not possible that in the work of the Industrial Fatigue Research Board and its successor a useful precedent may be found' If psychologists can answer these questions in advance of actual and possibly painful experience so much the better

I am, Sir, yours faithfully,

COUNTRY GLOW-WORM

Sept. 14

DR CHARLES MILLER

A MEMBER of the staff of University College Hospital writes 'In 1937 our hospital was faced with the retirement of its only remaining physician of mature years The desire to obtain the experience and stability of a senior man was translated into an invitation to Charles Miller to become senior physician for what would have amounted to 3½ years until he reached the usual retiring age It was not expected that his appointment would call for any great effort on his own part and it was hoped that his mature judgment would in itself be sufficient justification for this unusual invitation But Miller proved to be very much more than a mature mind, his drive his personality and his kindness quickly secured for him an affection that could not have been greater had he devoted his whole life to the hospital

"He never missed his ward rounds or outpatient clinics and returned to the problems of teaching with great enthusiasm, his attendance at committees was regular and his opinion always frankly expressed Dr Miller had an almost uncanny habit of scenting out clandestine wrongs, and bringing them into the open to put things right, whether the matter affected nurses, patients or students he could not tolerate anything that was unjust or unkind

'As senior physician in a strange school he may sometimes have felt his position to be difficult, it is to be hoped that he realised to the full the affection which he so quickly achieved of colleagues nurses and students His experience and friendship were freely at the service of all his juniors many of whom have reason to remember with gratitude his help and advice His death has taken from us a much loved man"

DR LEONARD WILLIAMS

Dr AGNES SAVILL writes With the death of Dr. Leonard Williams there has passed away a picturesque personality who will be sadly missed by a large circle of friends and patients The public knew him by his emphatic views on diet and his scathing denunciations of the over athletic and hedonized examples of modern girlhood who neglected the finer qualities of womanhood which he held in veneration He never hesitated to flay his opponents with a peculiarly pungent pen but even his victims enjoyed the perusal of their castigation in witty and beautiful prose He had the artist's appreciation of beauty particularly in the choice of words and phrase in writing and in oratory His naturally beautiful speaking voice added to the attraction of his stimulating conversation and public speeches The latter often given in French and German and always with unbelievable eloquence used to captivate his medical audience Because he lived beyond the allotted span it is now forgotten that he was a pioneer several years before the late war he introduced small doses of thyroid and other ductless glands and became a strenuous advocate of the use of raw and fresh foods What has become a commonplace to-day was advocated by Dr Williams many years before science had heard of the vitamin content of such a diet

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P

THE House has now got into a regular war-routine The Prime Minister makes a weekly statement on the conduct and progress of the war and on this matters of policy come under review by the House Questions also have resumed their place on the order paper, and by means of questions any matter of special or local importance can be brought up and ventilated This is where the art of the supplementary question is displayed, for this can be framed in a way which would not "get past" the scrutiny of the wording which all printed questions undergo. The scrutiny is to make sure that questions come within the rules of order and the rules of the House Broadly, this means that they must be questions addressed to the Minister concerned on matters which are his concern and not, for example, the concern of a county council or a private organisation Great use is being made of the "motion for the adjournment" in order to facilitate debate. It is on this motion that the Prime Minister makes his statements and on which any general matters of policy can be discussed

Opposition in the sense of Party opposition on peace-time lines no longer exists The Opposition has become the constructive critic of the Government's proposals and actions and the guardian vigilantly on the watch against any infringement of civil rights or liberties

* * *

Criticism in the House of Commons is very free and in the last week was expressed with emphasis on two important matters Firstly there was criticism of the Ministry of Information and the censorship whose actions in censoring the publication of the news of the presence of British troops in France—which had been announced to the world at large on the French radio—caused the confiscation of daily papers already printed and quite needless expense, confusion and irritation. The responsibility for this was attributed by Mr. Greenwood, who is leading the Opposition with conspicuous vigour and ability, to the Minister of War, and it is very desirable to have this freedom of criticism and discussion to bring such matters to the light

Another useful discussion was that on the education of school-children and the evacuation of mothers with children under five and expectant mothers to the rural and other reception areas in Great Britain The debate made it clear that the two problems are distinct Speaking generally, the evacuation of children of school age has proved very successful The reception areas have provided for the children very well, the vast majority of them are happy and contented and the minor personal difficulties are being adjusted by that tact and understanding for which the Minister of Health has pleaded in a circular sent to all local authorities

In the debate too much attention was focused on the occurrence of verminous conditions among the children. Unfortunately, in a proportion of school-children for all areas some verminous cases are found Naturally enough, the evacuation of these children has turned a spot-light on their condition, and the unfortunate householders upon whom these verminous children have been billeted have experienced at first-hand the conditions which are bred out of the least well-cared-for stratum of the population. The facts are of course well known to doctors, but they have come as a shock to the dwellers in many pleasant villages and little county towns

A number of cases were mentioned in the House where evacuees had such filthy habits that they used their bedrooms or other rooms in the home where they were staying as a latrine It would be interesting to know how widespread this was and how many cases were actually involved Probably the total number in the county could be counted in tens But why did such things occur? Was it the psychological effect of the uprooting from the town, the journey to a sometimes remote county area, the darkness of the country and the absence of the familiar water-closet—or are the cases of subnormal type? Complaints come from parts of the country as wide apart as East Anglia, Wales and Scotland, but the actual numbers were certainly small

* * *

It is clear that the shifting of population from the towns to the country—and of a predominantly child population—will necessitate the setting up of medical and nursing services and of clinics on a scale unprecedented in rural areas The desirability of a communal mid-day meal was stressed in the debate and by the Minister of Health in the circular sent to local authorities And it was suggested in the debate that this meal should be so balanced as to constitute, with the normal breakfast and tea meal obtained in the billets, an optimum diet from the medical point of view With the larger number of children of the nation in the country areas the opportunity occurs of greatly improving their physique and using the war period as one in which the children of the nation will be brought up under ideal physical conditions The education services in the country will also need to be remodelled, and steps towards that are already being undertaken

One gets from these debates in the House a picture of vast forces at work remoulding the national life If the daily life of the school-children can be put on a sound and healthy basis, as now seems possible, we shall equip the young generation in a way that no whole generation has ever been equipped before. It is true that as at present arranged these optimum conditions, even if established, would cease at 14 or 15 But there is already a good prospect of improvement in the living conditions of adolescents Optimum conditions of these young people also would give a "peace" reserve of a new generation to take up the tasks which will fall to the world when the war is over

FROM THE PRESS GALLERY

Public Health Aspects of Evacuation

IN the House of Commons on Sept 14 a debate took place on evacuation. There was general agreement that the manner in which it had been effected reflected on the whole the greatest credit on all concerned, but there was some criticism of points of detail Mr. EDE mentioned cases where sanitation and water-supply were giving concern to the local authorities Mr. STEPHEN urged that in future the Government should see that each authority evacuating children appointed a responsible official to examine all the billets, and that evacuated children were provided with proper clothing and boots and shoes Captain THORNTON-KEMSLEY said that complaints had reached him that children and their mothers had been evacuated in a verminous condition and inadequately clad. Medical officers and sanitary inspectors should see that people of this kind were

evacuated in a clean state, or else sent into some sort of communal billets Care was also needed to see that where evacuated people made their own arrangements for feeding their children the money provided was actually spent on food for the children He knew of cases where the money had been spent on "red biddy" These people should be given coupons exchangeable for essential foodstuffs instead of money Major OWEN gave details of similar experiences in North Wales In some cases, as a result of the filthy habits of the evacuees, bedding clothing, and even blinds and curtains had had to be destroyed It was hard that there was no compensation for the losses endured by the people in these reception areas as a result of the lack of care and attention on the part of the medical authorities in the city of Liverpool Some of the evacuees had been sent out suffering from scarlet fever, diphtheria, and mumps

Mr COLVILLE Secretary of State for Scotland, said that he would like to believe that none of the stories was true about children being evacuated in an unclean condition, but he was afraid the evidence was that there were a number of such cases Except in the event of serious air-raids and burnings, every possible step would be taken in future to ensure that no child would be transferred to a billet in a verminous condition If it was necessary to remove a child who was not free from infection or disease he was anxious to make arrangements for the reception of such a child into an institution or other place where it could be properly attended to

Dr HADEN GUEST said that anyone who would take the trouble to read the reports of school medical officers in such places as Glasgow, London, Edinburgh, and in fact any town in the country, would find that unfortunately there was always a proportion of children who were verminous On the whole, so far as the unaccompanied school children were concerned, the evacuation had been an outstanding success It was unfortunate if the rooms of houses in the reception areas had been fouled by persons using them as latrines, but the explanation might have been a psychological disturbance due to the evacuation of people to unfamiliar surroundings These were abnormal cases which would be rectified as soon as people got to understand their new quarters and the usages which prevailed in country districts He urged that they should aim at giving every child from the town districts not only a good diet, but the optimum diet laid down by the medical authorities as necessary for the child's development. He had carried out a feeding experiment many years ago and found that it was possible to concentrate the major nutritive foods in the midday meal Boots and clothes should be provided through the school authority and paid for by the parents in instalments

Mr RONALD TREE said that provision should be made for children between the ages of one and five on a nursery-school basis This system was an answer to a great many of the problems arising in homes where parents had not had a chance to teach children habits which they should form when they were very young

Mr MCENTEE said that in Rutland it was impossible to provide for the evacuees free milk and cheap milk and other services to which they had been accustomed in the town areas as from which they came The Government might advise the larger local authorities to transfer their services where they could be effectively used for the children

Mr ELLIOT Minister of Health, said that the evacuation scheme on the whole had been a considerable success, but it admitted that they had had experiences from which they ought to learn In circular No 1871 the attention of local authorities had been drawn to the matter of the inspection of children The Government would do their best to deal with the public health aspects of the case The arrangements for providing evacuated children with medical attendance had been made with the cooperation of the British Medical Association Any householder with whom an unaccompanied child was billeted might without expense to himself, call in a doctor if he thought it necessary The Government felt that the general principle of asking parents to make a reasonable contribution towards these expenses was sound The suggestion that children under five should as far as possible be treated on the creche system, large or small, was one which the Government welcomed and to which they had called attention in their circular

Medical Services

In the House of Commons on Sept 13, in the course of a statement on the war situation, Mr CHAMBERLAIN said that some 200,000 hospital beds had been made available for the reception of civilian air raid casualties These beds, of course, were also available for service sick and casualties and a certain proportion of them were now in use for that purpose It was also a part of their scheme that these hospitals should continue to admit ordinary acute surgical or medical cases amongst the general population This "reflux" was now taking place and would continue Any patient whose medical condition required inpatient treatment should be able to obtain it These cases would naturally encroach upon the number of beds immediately available for the reception of casualties, but that was being met by increasing the numbers of extra beds, by pressing forward with the building of hutted wards, and by providing further temporary accommodation in large tents, so that in spite of fresh admissions the number of beds immediately available had been maintained at the figure of 200,000 Furthermore, they had asked that outpatient facilities for the ordinary civilian sick should be maintained and this was being done The first-aid posts, both fixed and mobile, had been in general duly established and equipped and the emergency ambulances had been assembled and fitted up Motor coaches in the provinces as well as in London had been converted for use as inter-hospital ambulances The full complement of casualty evacuation trains for civilian cases had been assembled and staffed and provided with medical equipment Some shortage of extra beds, bedding, dressings and surgical equipment had been reported from a number of places, but this was being met as rapidly as possible by accelerating the delivery of goods on order, by the diversion of supplies from places more favourably situated and by placing fresh orders In particular, surgical instruments were now being delivered in considerable numbers and others had been obtained on loan from hospitals and surgeons having a surplus available

University Finance

In the House of Commons on Sept 13 Sir DONALD SOMERVELL (Attorney General) moved the second reading of the Universities and Colleges (Emergency provisions) Bill He said that part I applied to the universities of Oxford Cambridge, and Durham, and the colleges and halls within those universities, and the colleges of Winchester and Eton These were the institutions which were dealt with by the Universities and Colleges Estates Act, 1925 Part 2 applied only to the universities of Oxford and Cambridge and to their constituent colleges, and provided for alteration of procedure applicable to those institutions as laid down in the Oxford and Cambridge Act 1923 This bill was similar to an act which was passed in 1916 The result of war conditions on these institutions would be a substantial loss of revenue, fewer students meant less fees and dues Part 1 enabled the various bodies to draw on the future for the needs of the present Other universities had similar problems which would require separate legislation Clause 1 of this bill enabled the institutions to borrow not only the capital charges but also to make good any deficiencies in revenue due to war conditions and clause 2 enabled the period of repayment of existing loans to be extended The bill also empowered these universities and colleges to make emergency statutes

QUESTION TIME

SEPT 13–15

Standard of Accommodation for Evacuees

Mr PARKER asked the Minister of Health whether any general standard of accommodation had been laid down for evacuees in reception areas; and whether children could be removed from unsuitable dwellings—Mr. ELLIOT replied The standard generally observed in billeting evacuated persons is on the basis of one person per habitable room It may have been necessary to exceed this standard as a temporary measure, but redistribution from overcrowded districts is now taking place Local authorities in the receiving areas have been instructed to set up welfare committees to supervise the general welfare of evacuated children and see that they are not left in homes found to be unsuitable

Cod-liver Oil

Mr LAW asked the Chancellor of the Duchy of Lancaster, whether, in view of the evacuation of children and nursing and expectant mothers, steps had been taken to ensure that adequate supplies of cod-liver oil were available in the evacuation centres—Mr W S MORRISON replied *There are ample supplies of cod-liver oil to meet* all requirements, and I understand that the reception areas are obtaining the full quantities they need through the usual channels

Enrolment for National Service

Mr GRENFELL asked the Minister of Labour what steps should be taken by persons who wished to offer their services upon work of national importance, whether paid or unpaid—In the course of a circulated statement in reply Mr E BROWN said that *members of the medical, dental or* pharmaceutical professions should not apply to the Central Register, but should consult the appropriate professional organisations if they desired advice or guidance

Emergency Medical Services

Mr PARKER asked the Minister of Health whether he was aware that there was great discontent in the emergency medical services arising out of the fact that many nurses, medical students, doctors and others were expected to give their services voluntarily or for purely nominal remuneration, and whether he would examine and rectify these grievances—Mr ELLIOT replied No, Sir, I am not aware of any such discontent We have in this country a great tradition of voluntary service to those in need, and those who give such service, whether in peace or in war, are rightly proud of it Standard rates of payments have been arranged for doctors, nurses and nursing auxiliaries *employed wholetime in the service* With regard to medical students, I understand that in general they are most willing to assist in the treatment of casualties, and I cannot believe that they wish to profit by the circumstances of the war

Replying further to Mr. Parker, Mr ELLIOT said that he would undertake to investigate any grievances brought forward

Regional Commissioners

Replying to Sir HENRY MORRIS-JONES, Sir JOHN ANDERSON said The Regional Commissioners have now been charged by warrant with a responsibility of ensuring that the civil defence plans of the government departments and local authorities are properly coordinated Under present conditions they are not invested with specific powers, but they are in a position to use their influence to secure the completion of local civil defence preparations and the smooth working of measures already in operation In the event of a breakdown of communications the commissioners, in consultation with the regional representatives of government departments, will exercise the powers vested in His Majesty's Government until communications have been satisfactorily re established

Sir H MORRIS JONES asked whether the it hon gentleman would assure the House that the present democratic system of local authorities would function until there was lack of communication.

In reply to a further question Sir J. ANDERSON said I understand that the normal system is working, but that it has been most usefully and valuably reinforced by the addition of an emergency organisation held in constant readiness to function in the event of any interruption

The Minister, he added, had an overriding authority over the commissioners.

Sir FRANCIS FREMANTLE Does not the Minister recognise the great confusion arising from the use of the words "Regional" and "Regional Commissioners" when the Minister of Health is always referring to the regionalisation of the Ministry of Health?—Sir J ANDERSON There should be no confusion Regional commissioners have been appointed for the twelve areas into which the country has been divided, and partly in consequence of that plan the arrangements by which the different ministries concerned in civil defence carry out their local functions have been brought into line, so that the Ministry of Health and other departments have a regional representative at the headquarters of each regional commission That makes for the elimination of delays.

Production of Medical Supplies

Mr PETHICK-LAWRENCE asked the President of the Board of Trade whether he would give an assurance that in placing restrictions on normal production he would give sympathetic consideration to all forms of medical supplies and of supplies intended to relieve physical defects, including, in particular, high-tension batteries used in the latest *implements for the deaf*—Mr STANLEY replied It is not possible to give any guarantee as to the treatment of any particular class of goods, but every endeavour will be made to give due weight to every reasonable claim

May I take it that sympathetic consideration will also be given to other parts, such as cords, condensers and other things required for the implements—Yes, Sir

Powers for the University of London

Sir ERNEST GRAHAM-LITTLE asked the parliamentary secretary to the Board of Education whether, in view of the membership of convocation of the University of London exceeding 17,000 graduates, he had considered giving relief by legislation to the authorities of convocation from their statutory obligation of convening convocation for the conduct of elections to the senate and other offices or for ordinary meetings during the present crisis—Mr KENNETH LINDSAY replied A bill is already before the House giving the Universities of Oxford and Cambridge a general discretionary power to make emergency statutes and this power makes possible the suspension of normal statutory obligations *The most convenient way of meeting* the difficulty raised would seem to be that the University of London, perhaps in common with other universities, should seek similar powers

Hospital Treatment of *Athenia* Survivors

Mr ROBERT GIBSON asked the Secretary of State for Scotland how many survivors from the *Athenia* were received into hospitals on arrival ashore, into what institutions they were received, and how many were still receiving treatment—Captain MCEWEN, under secretary, replied 30 survivors were admitted to hospitals in Scotland on landing Of these 19 were admitted to the Western Infirmary, Glasgow, 2 to the Victoria *Hospital*, Glasgow, and 9 to the Royal Infirmary, Greenock Thirteen are still receiving inpatient treatment The Secretary of State would like to express his appreciation of the prompt *measures of assistance carried out by individuals and* public bodies in Glasgow and Clydeside.

Extension of Summer-time

Replying to several questions Sir *JOHN ANDERSON said*: I am not yet in a position to announce a decision If summer-time is to be prolonged beyond Oct 8 the question what should be the terminal date requires careful consideration and inquiry into that question is still proceeding. I hope to be able to make an announcement shortly

IN ENGLAND—NOW

(FROM OUR PERIPATETIC CORRESPONDENTS)

HAPPENING to Guy's yesterday I found many garden games going on in the "Park." Much of this has been converted into an elaborate fortification and the engineer may be commended for his power of improvisation. Some time ago he built a new chimney for the works, and had the old one, an iron tube, lying in the yard. This was in sections which he unbolted and cut each section longitudinally. He then had his trenches dug six feet deep and of such a width that his half tubes fitted on the top. When these were in place earth was piled on them and sandbags fitted over all to prevent the earth loosening. The entrances were then improved with further sandbags. All this kept the boys pretty busy for a week, but it is now finished. It is, I believe, lit by electric light, but I do not think they have allowed for urinals. I fear that with youths of both sexes in their night attire the ground may become fouled with moisture, if the old phrase for the condition in which we are when awaiting our Final exam is a true description of the physiology of fear. I believe it is in the Good Book, but a hasty glance through my Cruden does not enable me to put my finger on it.

So *The Lancet* has gone to Aylesbury. My only visit there was by bicycle from Hampstead in 1898—it was 80 miles and I was whacked at the end of it. Now slips of girls do 120 in a day, I believe, and do not turn a hair. I suspect it is the road surface, but the bicycles are also lighter, higher-geared, many-geared and have free-wheels. I remember Aylesbury on market day as the sleepiest old country town I have ever seen—except perhaps Wantage. I suppose the war has changed all that.

* * *

Oxford in war time sets one wondering. Balliol and Christchurch have large yellow notices outside announcing that they are air raid shelters, while behind boards the new Bodleian, just out of its scaffolding, reminds us of the things we used to think worth building. I suppose there are reasons which justify smashing up all the lovely things in this world, but here they seem very remote and rather inadequate. Oxford always reminds me of the Old Town at Frankfurt, where I've spent so many happy days. I don't quite see how a tit-for-tat argument with bombs (you smash our Magdalen, we smash your Römer) does advance the political organisation of humanity. If both sides can and do confine themselves to pamphlets and military objectives, in the gentlemanly way they have done so far, war may yet become a civilised occupation for those who like it. I suppose the real trouble will begin when one side starts to get the worst of it.

* * *

To get back to Oxford, and in particular, the Radcliffe. There, evacuation of convalescents has been followed by an influx of London evacuees. The neuro-surgical department is as busy as ever—everyone seems to want to get their skulls cracked by Mr Cairns before bombs do it for them. Each month Oxford is being called upon to find accommodation for 200 London women in their last days of pregnancy. Some of them are in the fine new maternity block at the Radcliffe, some in Ruskin College, some in Lynsham Hall and some in the new casual ward at Kidlington. After delivery they are either to be billeted in the district or returned to London. When the Thomases and Guy's students are to stay when they arrive at Oxford I don't know.

* * *

The Radcliffe also accommodates the extremely efficient municipal cleansing station. Cleansing these days in anti-mewing mustard gas rather than bugs or scabies. In an outer chamber the outer garments of the contaminated are removed. Then the sheep are separated from the goats—the males into one stripping-room, the females into another. Each then passes through a double row of showers, in the middle of which are arrangements for eye douching. Finally, fresh clothes are provided and the fortunate decontaminees of Oxford emerge from a common door, regardless of sex.

* * *

A great many people are hoping or fearing that the Ministry of Health's emergency medical service is the beginning of *state medicine*. The shower of criticisms which it is at present receiving would not perhaps have burst if the expected cataclysm of bombs had descended on London. As it is, a great many doctors are twiddling their thumbs and thinking about their salaries. The only people who seem to be completely satisfied with their share of the new national debt are the house-officers, who receive from a benevolent Government the princely wage of £350 a year plus an extra £100 if living out. This is about £350 a year more than most of them have been accustomed to receive. The higher doctors, if ranking as specialists, bag £800 a year, while if classed only as medical officers they must be content with £550 a year. A few chosen individuals in charge of whole hospitals pass the thousand mark. In the old days of voluntary hospitals and honorary staffs, a man could hope to make £1000 at 35 even if he was one of a staff of perhaps forty honoraries. In the new scheme of things that privilege appears to be reserved for one member of the hospital staff only. Not unnaturally the seniors think it would be a good thing to dock some of the house-officers' salaries to augment their own. And it must be admitted that there is something in the argument. The young man recently qualified living in residence has no expenses beyond his clothes, an occasional hair-cut, and a sports car. With petrol rationing even the sports car is redundant. The older man with a wife, a house or flat, a room in Harley Street and a couple of sons at a public school can look forward only to an increasing burden of personal debt in the service of his country. At the same time, the case for paying the house-officer a reasonable salary is a strong one. In the past those of us who were unfortunate enough to have no private means have been thankful that resident appointments left little free time in which to study our poverty. The London voluntary hospitals have traded on the value of resident appointments to get cheap labour and only in the provinces have most house appointments been paid. The Ministry has at least put a stop to this exploitation of the youth. One only hopes that it will also find some way of doing justice to age.

* * *

Two workmen were sitting opposite me in the train discussing the war. One of them said, "When I get home at night I always switch off the jazz on the wireless and tune in to a German station. I don't hate the Germans, they make such tuneful music."

' I think the day is coming when we shall stop talking about 'mental disease' and 'physical disease' because I am convinced it is an artificial and wrongful separation. The human organism becomes ill, and one cannot separate the human organism into separate entities any more than one can consider it apart from its environment. I say the distinction is an artificial one because it was thought that dementia paralytica was a 'mental disease' and then was discovered to be caused by the spirochete. Does it now become a physical disease with mental symptoms? It may be demonstrated that there is scarcely a physical disorder that doesn't have its mental concomitants—a carbuncle on a patient's neck has a definite influence on his personality.' More difficult, perhaps, but just as logical is the assumption that there is no so-called mental disease that does not have its physical concomitants which may ultimately be demonstrated. (CHARLES BURNHAM, *J. Amer. Med. Ass.*, July 29, 1939, p. 379.)

OBITUARY

FREDERICK SPENCER LISTER

KT, M R C S, LL D CAPETOWN

Sir Spencer Lister, who died at Johannesburg on Sept 6 at the age of 63 had been director for the last fifteen years of the South African Institute for Medical Research. He will be remembered as one who boldly applied the principles of immunology on a large scale to the needs of the community For some time past he had suffered from the strain of constant diligence, and it was a heart attack which ended his life suddenly in the library of the institute.

Frederick Spencer Lister was born at Norwell, Notts, and after a private education he entered St. Bartholomew's Hospital, where he qualified in 1905 Two years later he went out to the Cape as medical officer to the Premier diamond mines, spending five years there before going on to the Rand gold mines at Johannesburg. One of the gravest problems of the gold-mining industry was then the high death-rate from pneumonia amongst the native labourers After a favourable trial by A J Orenstein of active immunisation with pneumococcal vaccine, Lister was entrusted with the task of doing a grand-scale experiment in preventive medicine In those days little was known of specific bacterial antigens Lister typed the South African pneumococci, working concurrently with the American bacteriologists who were then attempting to classify them, but, it should be added, quite independently Some may regret that the American nomenclature was retained rather than Lister's In this great experiment Lister had not the advantage of knowing what part in pneumonia was played by associated bacteria, nor had he the opportunity of statistical planning. Certain it is that the death-rate from pneumonia among the native labourers dropped sharply between 1916 and 1920, concurrently with the mass inoculation But it must not be overlooked that from 1911 on the recruitment of tropical natives had ceased and improvement had already set in For this work Lister received a well-earned knighthood in 1920 Four years later he succeeded Dr Watkins-Pitchford as director of the South African research institute and became president of the associated scientific and technical societies of South Africa When the University of Witwatersrand came to include a complete medical school Lister was appointed honorary professor of pathology and bacteriology, the actual teaching being delegated to members of the staff of the institute, an arrangement which served well to keep the school and the institute in close touch. From 1928 he served on the South African Medical Council, and in the following year the University of Capetown conferred upon him the honorary degree of LL D.

The impression Lister gave on his co-workers was that of a keen and critical worker with a true interest in research A man of personal modesty, he was well liked by those who came in contact with him and valued his simple forthright character His laboratory gifts, as befitted a pupil of Almroth Wright, were of a high order They were on the technical side rather than in the imaginative field, and it may be for this reason that one of the largest human epidemiological field experiments failed to give as much information as it might have done Outside his devotion to laboratory medicine Lister had few interests apart from sport.

Sir Spencer Lister was twice married His first wife, who died in 1919, was the daughter of Leonard Baker In 1921 he married Ruby May, younger daughter of W P Johnstone of Durban, who survives him with a son and a daughter

NEW ZEALAND

(FROM OUR OWN CORRESPONDENT)

NATIONAL HEALTH INSURANCE

THERE is no further development in the national health insurance scheme. The government has been occupied with the budget, which includes considerable increases in taxation, particularly on income and petrol The Prime Minister has just been operated on, the Finance Minister is still abroad and the Health Minister has been acting as prime minister in addition to his other duties A revised scheme for maternity services, including provision for extra payments for complications and consultant services, without any contract between doctors and government, is under discussion. It is being voted on by members of the B.M A by secret ballot, and the results are not yet published. It was announced before the ballot that the government had accepted the scheme in principle

STAFF CHANGES AT AUCKLAND HOSPITAL

Eighteen months ago the board created two new full-time posts at Auckland Hospital, the chiefs of the divisions of medicine and surgery, at salaries of £N Z.1500–2000 There was no consultation with the honorary staff about this step, but when Dr. C. R Burns and Mr J M Clarke were appointed, it was on the advice of a wide and representative medical committee. This feature made the occasion noteworthy Never before in medical appointments had any expert advice been properly sought, much less acted on These reforms were part of a larger scheme, planned to include the abolition of the post of medical superintendent, and were intended to introduce more order and responsibility on the clinical side Certain influences were brought to bear, and the post of M.S. was not abolished The two appointees arrived after some months, to find their powers already diminished on paper. A change of board (elected by popular vote every three years) confirmed their impression that they were not really wanted, and after about a year of office their appointments were terminated on the score of economy Only one member (a junior physician) of the honorary staff has recorded publicly a protest against such summary dismissal of two eminent men The profession has been silent, but considerable public protest has been made, including a petition from the bulk of the in-patients, and another from a large majority of the nursing staff. By these it was claimed that since the men had arrived the general tone and morale of the hospital had improved, and that gaps in the work of the hospital left by the honorary system of staffing had been filled. While it is clear that most of the senior members of the staff desired the abolition of the posts, there is a section of the middle and junior group in the city that deplores the move. These see in it a setback to proper coördination of the clinical work, and to the introduction of academic standards into the appointment of the honorary staff.

UNIVERSITY OF OXFORD.—The appointment of a deputy to carry on the duties of Dr. Lee's professorship of anatomy has been cancelled, as Prof. W. E. Le Gros Clark, F R.S, has withdrawn his resignation from the professorship.—Dr. K. J. Franklin is deputising for Dr. B G Maegraith as dean of the medical school.

Medical News

General Medical Council

An election is about to be held of one member of the General Medical Council to represent the registered medical practitioners resident in England Nomination papers, which must be signed by not fewer than twelve registered medical practitioners, must reach the registrar before Oct 3

Royal Cancer Hospital (Free)

The course in physics and medical radiology to be held at this hospital will begin on Oct 3 as arranged Further information will be found in our advertisement columns

Radium

The National Radium Commission has indicated that radium treatment is likely to prove impracticable in the earlier stages of the war and centres have taken steps for the continuous storage of their radium underground According to *The Times*, most of the national stock has been buried in a 50 ft bore hole drilled specially for the purpose When more experience of war conditions is available it is hoped that it may be possible to resume treatment Correspondence for the Radium Commission should be addressed, until further notice, to the office secretary at 18, Park Crescent, London W 1

EMERGENCY NOTICES

The annual meeting of the British Medical Association which was to have been held in Birmingham next year will not take place

The annual conference of surgeons of the St John Ambulance Brigade, which was to have been held in London on Oct 14, has been cancelled

The course of lectures on neurology which was to have been held at the National Hospital, Queen Square, London, this autumn will not take place

No meeting of the Society of Public Analysts and other analytical chemists will be held until further notice

The St Marylebone and Western General Dispensary is open for outpatient treatment only and a list of the clinics which are carrying on may be had from the secretary of the hospital, 48, Cosway Street London, N W 1

The British Hospital for Mothers and Babies, Woolwich, has received permission to retain all its 52 beds for the use of women in and after labour Although already fully booked for the next seven months it has undertaken to receive all the maternity patients from the Garrison Maternity Hospital and the War Memorial Hospital, Woolwich

Of the 60 beds at the Plaistow Maternity Hospital 40 have been vacated, the remaining 20 are being used for emergency and abnormal midwifery cases Many of the expectant mothers of the district have been evacuated and several midwives have gone with them but there are still a great number who have refused to leave and the majority of these will have to be confined in their own homes by the midwives attached to the hospital

The Chadwick public lectures which were to have been delivered this autumn have been postponed for the present Notice will be given when they are to be resumed

For the duration of the war the head office of Messrs Watson & Sons (Electro Medical) Ltd will be at 7b, Castle Street, Reading (Tel Reading 60295 telegrams "Skingrain Reading) Their London office and all branches, with the exception of Glasgow, will remain open for sales and service

The King's College Hospital annual dinner of past and present students has been cancelled

Mrs BURDEN benefactress of the Stoke Park colony, Bristol has died Her husband the Rev Harold Burden founded the colony and after his death she continued to live there her last gift being the neurological institute which was opened by Sir Thomas Inskip on May 12

Appointments

BRASS SYDNEY assistant physician to the skin department, St Paul's Hospital, Endell Street London

BRODY, M B , M D Sheff D P M senior resident physician at the Runwell Mental Hospital Wickford, Essex

CLAYTON, T M , M D Durh , D Hy D P H , D T M , medical officer of health for Blaydon on Tyne

HAMILTON, BETTY C L R C P E , L D S R C S F D P H , assistant school medical officer for Derby

JACKSON, D C M B Melb resident medical officer at the Birmingham Children's Hospital (King Edward VII Memorial)

MACFARLANE G N , M B Dubl , resident surgical officer at Birmingham Children's Hospital (King Edward VII Memorial)

MATEER MARY H M D Lond F R C S , M R C O G , obstetric assistant and tutor at the Liverpool Maternity Hospital

PEMBERTON, MAX, M B N Z F R C S , surgical registrar at the Aberdeen Royal Infirmary

SUTHERLAND, CATHERINE M M B Edin , resident medical officer at the Jessop Hospital for Women Sheffield

WATSON, A J , M D Durh , B Hy , D P H medical superintendent at the Mildmay Mission Hospital, London

Examining Surgeon under the Factories Act, 1937 Dr J G CLARK (Dundee district Angus)

Medical Referee under the Workmen's Compensation Act 1925 Mr H W GABE F R C S for the county-court districts of Haverford West, Pembroke Dock and Narberth

Births, Marriages and Deaths

BIRTHS

CHANCE.—On Sept 14 at Dublin the wife of Dr Oliver Chance —a daughter

FORSYTH.—On Sept 15, at Royal Naval Air Station Winchester the wife of Surgeon Lieut -Commander V S Forsyth—a son

PARKER.—On Sept 16 at Oxford, the wife of Mr A S Parker D Sc —a daughter

STEPHENS.—On Sept 10, at Srinagar Kashmir, the wife of Captain L R Stephens R A M C —a son

WILKINSON.—On Sept 11, the wife of Dr M C Wilkinson of the Essex County Sanatorium Black Notley—a daughter

MARRIAGES

BIRT—HUSBAND.—On Sept 15, Alan Beckett Birt M B to Joyce Staunton Husband

CHAMBERS—STEVENS.—On Sept. 9 Captain Alfred Chambers, R A M C to Susanna Ruth Stevens

COOMBS—BLAND.—On Sept 9 at Bristol Charles John Franklin Coombs M B to Barbara Bland

CUTTING—MASTERS.—On Sept 15 at Wimbledon Park, Alfred Howard Cutting M R C S to Margery Masters B Sc

JONES—STRONG.—On Sept 9 at Ilsley Church William Alyn Jones M R C S , to Doris Whitley Strong

PAGE-CROFT-PIERNOV.—On Sept 9 at Claygate, Ernest Donald Page M B , to Isobel Margaret Torrance Stephenson

VAN MEURS—WYKES.—On Sept 11 at Kingswood Dennis Peter van Meurs M B to *Marjorie Norah Wykes*

WEST—FLEMING.—On Sept 7, at Ardee, Eire Robert George Hayward West M D M R C P to Jean Edith Fleming

WYKES—MITCHELL.—On Sept 15 at Leeds Peter Hitchcock Wyon M B to Agnes May Mitchell M B

DEATHS

HONEYWILL.—On Sept 17, Laurence John Honeywill F R C S , of Bournemouth

JOHNSTONE.—On Sept. 17 at Preston, Thomas Johnstone M D Edin , M.R.C.P late of Ilkley and Harrogate aged 86

KENNEDY.—On Sept 12 at Bucklebury Common Berks David *Kennedy M B Lond*

LOCKETT.—On Sept 14 Gerard Edward Lockyer, M R C S of Houghton Norfolk late captain R A M C

ROBINSON.—On Sept. 16 at Glasgow Harry Watt Robinson M B Glas of Bridge of Weir

WILLIAMS.—On Sept. 14 at Horsham Alfred Henry Williams M D Edin aged 75

The Lancet 100 Years Ago

September 21, 1839, p 932

From a leading article on the case of the Apothecaries Company v Greenough

The public will be the greatest sufferers by the anarchy of the medical profession The lives lost by murder, manslaughter, lightning, precipitation from monumental columns, hydrophobia, explosions in mines shipwreck and accidents of every kind, will be inconsiderable when compared with the numbers that must perish legally, on one hand by the injudicious administration of poisonous drugs and on the other by the absence of the skilful well-directed, energetic treatment of the scientific practitioner

NOTES, COMMENTS AND ABSTRACTS

FILMS FOR DOCTORS

THE world we live in has sharpened our eyesight perhaps at the expense of our hearing The teacher of today realises that many of his pupils are more sensitive to visual than to auditory impressions and he neglects no medium that appeals to the eye The film as an auxiliary in medical education, and especially in postgraduate medical education, was discussed by Dr. E Kittler at a recent meeting of the Berliner Medizinische Gesellschaft (*Disch. med. Wschr.* Aug 4, 1939, p 1242). One of the most obvious uses of films is to show the doctor minor surgical procedures which he may use in his own consulting-room. Films of major surgical operations are also of some value to the postgraduate Such films should not be overloaded with detail, but should concentrate on general methods and end-results. In obstetrics and gynæcology the film can to some extent compensate for the scarcity of clinical teaching material available to postgraduates Medical subjects do not at first sight seem appropriate to illustration. Kittler suggests, however, that if we were less shy of using trick photography there is a wealth of material waiting to be used. An article by Rosenthal in our own columns (1938, 2, 340) describes some ingenious methods of graphic instruction that might be embodied in cinematography.

DEARER DRUGS

THE wholesale prices of the following drugs have increased substantially: tannic acid, ephedrine, phenazone, sulphanilamide, atropine, ergot of rye, cascara sagrada, gentian root, tragacanth, gum acacia, agar agar, aloes, ipecacuanha, hydrastis, rhubarb, menthol, senega root, colocynth, cod-liver oil, olive oil, eucalyptus oil, peppermint oil and aniseed oil. Some of these—tannic acid, ephedrine, cascara sagrada and ergot of rye—have doubled in price There has been a further advance in the price of bismuth carbonate, while makers of resublimed iodine, iodoform, potassium iodide and sodium iodide have, as anticipated, raised their prices to correspond, more or less, with the increase in the cost of crude iodine noted last week The prices of calomel, corrosive sublimate and other salts of mercury have not been advanced as yet, but in view of the rise in quicksilver, higher prices for these drugs are likely. Potassium bromide, as well as other bromides, is dearer Although the official price of quinine has not altered, this as well as chloral hydrate should be dispensed with caution. A rise in the price of camphor is almost inevitable for the reason that turpentine, the key to synthetic camphor, is twice the price it was before the war: competition from synthetic camphor has kept low the price of the Japanese natural product These notes may serve as an indication to prescribers

A LOCAL USE FOR TESTOSTERONE

Mr. J. R Groome, of the department of zoology and comparative anatomy at Oxford, informs us of the successful use of testosterone propionate as a local application in the case of a uniparous woman of 33 who had difficulty in attaining an orgasm during sexual intercourse. Her external genitalia were normal except that the clitoris was so small that she was unaware of its existence An ointment containing testosterone propionate was introduced into the preputial sac with a small syringe twice daily, beginning at the end of one menstrual period and continuing until four days before the next The patient received approximately 6 6 mg. testosterone propionate by unction in seventeen days, the doses increasing as the treatment caused a slight enlargement of the preputial sac. A considerable increase in the clitoris was then reported, and the treatment was resumed for a further five days after the next menses The preputium was now found to be enlarged, and the glans clitoridis, which had drawn the frenulum with it, was normally just visible A month later the preputium had regressed to almost its normal size, but the clitoris and frenulum however had been maintained, and the resulting new erogenous zone was considered highly satisfactory. Mr Groome concludes that "rather less than 7 6 mg testosterone propionate administered by local unction over a period of twenty-two days will cause enlargement of the human clitoris without affecting the other genitalia or delaying the menses"

HANDWRITING

GRAPHOLOGY has been much exploited by charlatans in the past and for this reason has come to be associated in the public mind with the occult It is regarded far more seriously on the Continent than in England, and there are recognised courses on the subject in several European universities In his "Analysis of Handwriting" (London Geo Allen and Unwin, pp. 232, 7*s* 6*d*.) H J. Jacoby treats graphology as a science and interprets his results on an accurate psychological basis. The reader will have no difficulty in following his easy style but must not expect to be an expert graphologist when he has reached the last page. If Jacoby's remarks on illegibility are true, most doctors fall into the category of neurotic people wishing to conceal their weaknesses from the world.

LIGATURES

Mr T. E H Roberts, F.R C S, writes "On my visits to numerous hospitals in the London sector I find that in some cases there is anxiety about the stock of catgut for ligatures. While I am assured by the Ministry of Health that adequate stocks are held in the country, there may be here and there a lag between demand and supply . Under these circumstances may I suggest that fine linen thread, silk or sewing cotton may replace catgut for the ligation of vessels ? In fact these substances in many respects have an advantage over catgut No. 100 thread and No. 24 cotton which are obtainable from any draper are suitable, though many other sizes are also useful. In the same way linen thread or silk, preferably black, may replace silkworm gut for skin suture."

Vacancies

Barnsley, Beckett Hospital and Dispensary —Cas O, £250
Belfast Mental Hosp —Asst M O, £350
Brighton, New Sussex Hospital for Women, Windlesham Road — H P at rate of £100
Burnley County Borough —Sen Asst M O H, £800.
Doncaster Royal Infirmary —Orthopædic H S., at rate of £150 Also H.S at rate of £150
Dudley, Guest Hosp —H S, £150
Dunedin Hosp, New Zealand —Radiotherapist, £1100
Kettering and District General Hosp.—Jun H S, at rate of £150
Macclesfield, Cheshire County Mental Hosp, Parkside —Asst. M O, £350
Manchester Northern Hosp —Hon Surgeon
Reading, Royal Berkshire Hosp —H S, H P, and Cas O, each at rate of £150
St Helens County Borough —Temp Asst M O H for Tuberculosis, £600
Stafford, Staffordshire General Infirmary —H S, £175
Stockport Infirmary —Res Surg O, £250
Watford Borough —Temporary Asst M O H, £600
Medical referees under the Workmen's Compensation Acts, 1925, for the county-court districts of Holywell Flint and Mold (circuit No 29) Also ophthalmic specialist medical referee for the county-court districts of Accrington Blackburn and Clitheroe, Blackpool, Chorley, Lancaster and Preston (circuit No 4) Applications for these appointments to the private secretary, Home Office, Whitehall, London, S W 1, before Oct 8
Medical Referee under the Workmen's Compensation Act, 1925, for the Kirkcudbright sheriff court district (Stewartry of Dumfries and Galloway) Applications to the private secretary, Scottish Office, Whitehall, London, S W 1, before Oct 8
The Chief Inspector of Factories announces the following vacancies for examining surgeons Lander, Berwick; Carnforth, Lancaster; Morpeth, Northumberland.

ADDRESSES AND ORIGINAL ARTICLES

PERSONAL AND CLINICAL HISTORY IN HÆMATEMESIS AND PERFORATION

BY DANIEL T. DAVIES, M.D., B.Sc. Wales, F.R.C.P.
PHYSICIAN TO THE ROYAL FREE HOSPITAL, LONDON, AND
A. T. MACBETH WILSON, M.B., B.Sc. Glasg.
PHYSICIAN TO THE TAVISTOCK CLINIC, LONDON

EXPERIMENTAL stimulation of the hypothalamus or its nervous connexions with the stomach can produce changes in the motility and secretory activity of the stomach. Continued stimulation causes erosions of the mucosa and demonstrable hæmorrhage (Beattie 1932, Heslop 1938). An increasing amount of clinical evidence is now available to support these experimental observations (Alvarez 1932, Cushing 1932, Davies 1936). We have already drawn attention (Davies and Wilson 1937) to the nervous influences which appear to operate in certain personality types in precipitating ulcer symptoms and in determining recurrences. Disturbing situations and events, acting as precipitating factors by causing anxiety to the patients, were found to precede the onset or return of symptoms in 84 per cent. of 205 patients with peptic ulcer and in 42 of 52 radiographically proved recurrences. Comparisons were also made between two matched groups of ulcer and hernia patients. Using the latter as a control group, we found, for example, that unusual psychological tension, as shown by inability to rest, was a lifelong characteristic of 78 per cent. of the ulcer patients but of only 15 per cent. of the hernia patients. Further, external events of a potentially disturbing nature preceded the onset of symptoms of hernia in only 22 per cent. of the patients.

It was thought desirable to investigate the related problems of hæmatemesis and perforation and to record in identical manner observations made both on the predisposing factors which long antedated gastric symptoms and on the external events which preceded the catastrophe. The observations were made on 50 patients recovering from a hæmatemesis and on 25 convalescent from an operation for a perforated ulcer. Bleeding into the stomach may take place as a complication of such conditions as portal obstruction, blood diseases, and carcinoma, but its commonest cause is erosion of the gastric mucosa through acute peptic ulceration or as a complication of the chronic stage. The clinical course and rapid recovery of our group of hæmatemeses were such as to exclude these other pathological conditions. All the patients were examined by methods previously used to record, in brief outline, the characteristics of the individual before the onset of gastric symptoms and to obtain a dated clinical and a dated personal life-history of the individual.

Hæmatemesis

In the 50 patients examined it was found that definite psychological characteristics of two overlapping types antedated the onset of the gastric symptoms. These findings are recorded separately (Wilson 1939*a* and *b*). Of the 58 hæmatemeses these patients collectively suffered 47 were preceded by some alteration in their lives, of a type particularly capable of producing emotional stress. The precipitating events classified themselves most readily in relation to money matters, to the nature of their work, and to serious illness of near relations, with a small residue of miscellaneous disturbances.

EVENTS RELATING TO MONEY MATTERS

CASE 1.—A quiet and rather shy man, aged 22, with a squint, who left home at 18, with his five brothers and sisters, because of quarrels with his stepmother. Since that time he has suffered from restlessness and passing morning depression. Immediately after leaving home he was in hospital for a year with "pains in all my joints." Indigestion began six months after his discharge from hospital and a few weeks after he lost his regular employment. While unemployed he was admitted to hospital and treated for dyspepsia. Eventually he found "unofficial" work in a canteen. Again he lost his job and was for three weeks idle. Of his last unemployment benefit of *7s. 8d.* he gave *5s.* to his landlady, to whom he was in debt. On the next day he could only afford one small meal of fish and chips, and the following day he was admitted to hospital with hæmatemesis.

CASE 2.—A married man, aged 59. "I'm always pottering about doing something, if I sat still for five minutes, that'd be a miracle. I'm not nervy or highly strung, as I understand it, but I think perhaps I worry a bit. I never talk much. I swallow things and it's worse than getting rid of them. I'm inclined to swallow things and sulk about them." He has one boy at home, aged 26, one in the army, and a daughter married two years ago. Since the war he has kept a coffee stall. Indigestion began in 1929, at a time when "trade" began to fall off. In 1934 he failed in business and had his first "bleeding" a few days afterwards. His dyspepsia recurred and a second bleeding took place on the day his daughter married. At this time his son was out of work, he himself had only occasional odd jobs, and her departure made a big difference to the family income. Lastly, he "got extra work at the post office at Christmas time." "Although I was feeling *a bit run down, I didn't* refuse because I was glad of a bit of money. I finished on the 24th of December. My wife took to bed on the 25th with a bad leg that keeps her pretty low. She was fairly ill this time. She was *at my daughter's and I didn't* know how to get her home, so I kept running backwards and forwards. My last two teeth were taken out just before Christmas and that upset me." On Jan. 2 he had his third hæmatemesis. "*Whenever things* get to a climax this happens. As soon as it is over I'm up and all right again."

CASE 3.—A woman, aged 63, the youngest of eighteen, apparently cheerful with six children, all of whom are married. "Nothing moves me—I can't feel frights. Always been active and cheerful—it doesn't do to sit about and mope. Anyway I couldn't sit down for long. It kills me to be in bed." Since coming to London four years ago—her husband came from Wales to try to get work—she has had more headaches than usual and "a little indigestion with the different water." Her husband, aged 65, has had heart attacks. Since March, 1937, he has been out of work, and the doctor told her that his heart "may take him at any time." "Round Christmas, things were tighter than they've ever been since we've been married." Although now 63 years old, she had no indigestion at that time—"only a little lump in my side." On Jan. 3, 1938, she felt a little giddy but did not tell her husband. They "talked till it was gone twelve. I felt sick, and then brought up a lot of blood."

CASE 4.—A woman, aged 57, eldest girl of five children. She has had indigestion as far back as she can remember. It became worse in 1927, when she was worrying about her daughter for "we set her husband and her up in business with our savings and it became a white elephant. He's turned out no

good." In 1931 an appendix was dealt with successfully, but her indigestion was "still just as bad." In May, 1935, she had a nervous breakdown as a sequel to a quarrel with her son, who "had got on very well indeed." Three weeks before her husband's retirement on a pension she had a hæmatemesis. "My husband's retirement made a big difference to us—all our money went in my daughter's business."

The four examples quoted, two men and two women, indicate the close correlation we have noted between certain personality types, financial stress, and hæmatemesis. In the young man of 22 his first and only hæmatemesis took place at a time when his insecurity was at its maximum. Case 2, an older man of 59, had already suffered a good deal in disappointments, and his three bleedings coincided with episodes of some magnitude to him. Case 3, an active restless woman of 63, was worse off financially (and her husband afflicted with a heart "that might take him at any time") than she had been since her marriage, and after a discussion on the state of her affairs "till it was gone twelve" she vomited blood In case 4 the retirement of the husband, with the savings already gone, made the future uncertain, and three weeks before he resigned his work this nervous woman of 57 suffered her first bleeding In all, 16 of the 50 patients disclosed such stories of money difficulties preceding gastric hæmorrhage; 10 of the 16 were persons over 50 years of age, a time of life when security is all the more prized The stories relate to people of poor circumstances, where a few shillings make the difference between distress and relative comfort, but we have not found any difference in people whose finance may be of larger dimensions, as shown by the following example

CASE 5.—A man, aged 56, had suffered from dyspepsia for ten years; numerous radiological examinations had disclosed a duodenal ulcer, and the usual remissions followed upon courses of treatment. During one of these courses of treatment, and at a time when he was already symptom-free, he was awakened from sleep feeling faint and sick. He was found semiconscious by his butler in the early hours of the morning, having attempted to walk to his bathroom. He showed all the signs of severe hæmorrhage but it was some time before the inner history was disclosed. For the first time in his life hæmorrhage had occurred and this to a severe degree. It was also disclosed that for the first time in his life his good name had been doubted and, to redeem his name in the eyes of his bankers, he had to find a sum of £15,000 within a few days. This demand was made to him three days before the hæmorrhage.

INCREASE OF RESPONSIBILITY

CASE 6.—A man, aged 32, an only son, with children of 2 and 3½, formerly an exhibitioner, next a university lecturer, and now a sales manager, describes himself as "nervy and irritable, very ambitious, to be honest," "unable to settle easily to a book," and "rather inclined to get worked up about things" He "had endless trouble with my throat as a child," "disease of the knee," "appendicitis at 11." "My development was held up through always being ill." Indigestion began in 1923 (patient 17) "just before going to the university" (this meant coming to England from abroad), got worse when he finished his studies in 1927, and, after disappearing for "nearly a year," came on again in 1928, when he became lecturer in another university. He returned to his native country to go into business and after a year (1930) had severe pain shortly after his duties had become onerous. Treatment relieved the symptoms and he got married. "Shortly" after his return to business symptoms began once more. He bore it for some time but was eventually advised to leave home and come to Europe for an operation (1932). On his first night aboard ship he had his first hæmatemesis. He had a Billroth II operation and was free of symptoms until he had a hæmatemesis in "the first week in August," after the birth of his first child in July, 1934. Again he improved till January, 1936, when his second child was born, and his pain returned once more. In March of that year there occurred the first of two financial crises in his business, and in April he had his third hæmatemesis. This was preceded by a running nose and a cold, which did not, however, keep him from business. Again he improved until, in August and September, 1937, there was further difficulty in business, and on Sept. 28 he had his fourth hæmatemesis. He had "never noticed" the relation between the events in his life and his dyspepsia.

CASE 7.—A sea captain, aged 58, had enjoyed excellent health throughout his life at sea and prided himself on his digestion, although his facies showed all the features of the classical ulcer patient. Within recent months he began to suffer hunger pains and found that they were relieved both by food and by alkalis. These symptoms came on at sea when some difficulty was experienced in repairing an engine fault of his 14,000-ton and fully laden ship. Within scheduled time the cargo was duly landed at a foreign port While the last of the cargo was being taken on dock he vomited blood. After a stay in hospital he returned to England and was given charge of the boat again. Within twelve months, on landing another load of cargo (this time in an English port), he suffered another hæmorrhage. His story is interesting. Apparently before rearmament days ship engineers were available and any breakdown was adequately dealt with by a competent staff. Now there are better posts on land, and in his ship there was a deficiency of skilled engineering help. The fault that developed on the high seas was, to his knowledge, only patchily dealt with, and he knew that to negotiate the straits to the foreign port necessitated all hands and no engine breakdowns. Any delay in the straits might result in the total loss of the ship and endless inquiries. He was intensely anxious. The hæmorrhage followed on this anxiety. His second hæmorrhage took place in similar circumstances.

CASE 8.—A young woman, aged 25, employed in a children's home, without warning vomited a large quantity of blood in August, 1937. She had enjoyed good health previously and has remained well since. The story is simple. She entered the children's home as a help when aged 17. She was ultimately recognised as reliable, and more work and responsibility were placed on her shoulders In August, 1937, the matron was on holiday and the home was under the charge of the only sister in the establishment. This sister was taken ill suddenly, and the young woman found herself in sole charge. The bleeding took place at this time

CASE 9.—An accountant, aged 40, had a gastroenterostomy performed for a perforated duodenal ulcer in 1927. A hæmatemesis took place in 1933, and radiological examination at a later date showed that he had a jejunal as well as an active duodenal ulcer. In 1934 a lateral anastomosis was performed, for one of the jejunal loops was dilated and partially obstructed. With the correction of this mechanical fault the patient improved. A further X-ray examination, performed a month after the operation, showed no delay in the loop. The patient affirmed that he had never felt better, and he went back to work after a brief holiday. On his return he received "the biggest shock of his life," when his partner demanded dissolution of the partnership because the patient had been away from business too often and too long. Seven days later he suffered a hæmatemesis.

From the time of his recovery until 1938 he did reasonably well. Symptoms of dyspepsia recurred, and many medical opinions were sought. In May, 1938, he was influenced to submit to a gastrectomy as the only permanent cure of his trouble. He was

informed that this would also protect him from further hæmorrhage The gastrectomy was performed, and after a short convalescence the patient returned to work. In August he was away on holiday with his family His three children were taken ill at the hotel, and, at the same time, his wife fell down the stairs and fractured her leg To bring home the three ill children and the wife with a fractured leg was a matter of some concern This was safely accomplished, and four days later he had a severe bleeding

In these examples hæmorrhage followed upon periods of stress In two of the four patients gastrectomy had already been performed, but in spite of this protection, faced as they were with events in their lives which caused tension, hæmorrhage followed It is to be noted that the interval between the event and the bleeding was not more than a few days Stories of increased responsibility were given by 16 out of the 50 and in this series 10 out of the 16 were under 50 years of age

ILLNESS AND TROUBLE IN THE FAMILY

CASE 10.—A man, aged 46, married twice, four children, 19–24, is "of a worrying nature" and sleeps so heavily that it "would need a brass band" to waken him He is "extremely active" and says "The only thing that makes life bearable here in hospital is getting up I can't read—must be doing something" He is "very methodical and thorough" and, although he is very irritable, he "doesn't show it outwardly" In 1918 he ran into the traction-pole of a pair-horse van and, although he had no immediate symptoms, he "always anticipated trouble from that blow in later years" "I felt it strike my backbone" There were "no symptoms at all till Dec 31, 1937," when he developed "a dull uncomfortable pain" in the upper abdomen It was not enough to put him off his food and, on coming home on Jan 2, he said, "No pain to day" and had his usual supper The next morning is a little hazy in his memory, but his wife found him "standing, dazed, in the lavatory, clawing the walls saying 'I can't get out'" She led him back to bed, and he fell asleep Two hours later he got up and vomited a large quantity of blood

The wife seemed to have been a little unconcerned, and inquiry disclosed important facts Although he had previously said that he had never had a day's illness before the hæmatemesis, after the death (1922) of his first wife, for whom he had a strong affection, he was extremely upset and described himself as "nearly cracked for two years I used to do my driving with tears streaming down my face It affected my stomach, I remember that I put the four children (then aged 3 to 8) in a home at 12s a week each and went without my dinner two days a week to pay for it What upset me was that neither father nor mother nor my sister offered to help in any way" "Home wasn't happy—father was pensioned off by the brewery because he was always drunk Mother was my God until my wife died, and she wouldn't help me If I would go and have a drink with my parents they would see me, but I'm T T I did the 100 yards in 11⅕ last year" (he is 46) "Mother's health is going since October Everything seems to be blowing up at once" "My second wife is a lot of worry The children will all be going very soon—they've all got engaged in the last two years—then I'm going into a single room and she can come or go as she likes To make things worse, promotion is due any day"

CASE 11.—A man, aged 50, consulted one of us in 1934, with signs and symptoms of a duodenal ulcer Progress was uneventful, and he enjoyed good health for four years While returning home from business one evening his car skidded and he and his three companions were badly injured All were admitted to the nearest hospital, where it was found that he had sustained a fractured femur Extension was applied, and his convalescence appeared to be smooth At this time he complained of no dyspepsia The period of extension over, he was instructed to move and exercise his leg, under the guidance of the house-surgeon, when, to his dismay, the callus gave way and his leg fell helpless on the bed This caused bitter disappointment Extension was reapplied for another six weeks His wife saw him on the day of the disturbing event, and he expressed the opinion that he was "done for" The leg would not mend, he would be unable to walk, and he would not be able, as was essential, to get about to obtain business The world, so far as he was concerned, was finished, for his business was a one man show, held together by his wife during his incapacity Next day he complained of flatulence, and four days later the surgeon's attention was called to the pulse-rate of 120 and the pallor of the patient That day his stool was black and he vomited blood

It is of interest to note that not only had this man enjoyed four years' freedom but that after the accident no symptoms of dyspepsia appeared while his leg was in extension the first time He knew that within six to eight weeks he would be well and fit for work again But the failure of sound healing meant to him the end of his ability to work and, therefore, financial ruin Four days after this mental turmoil hæmorrhage took place

Fifteen such examples of trouble or illness either of the patient or of his family, were observed by us in this series, preceding the hæmorrhage

CASES WITHOUT EXTERNAL EVENTS

In 11 patients our inquiry discovered no precipitating event which could be regarded as of importance in producing an emotional disturbance before the hæmorrhage, but we feel that one of the histories is worth recording to demonstrate the predisposing characteristics

CASE 12.—A married woman aged 39, with children of 14, 12, and 10 She was the youngest of nine children and is "afraid she got spoilt" She was "nervous of everything" till she was 10 and remembers having "wind" even then She improved later and became the sole support of her parents until they died, just before her marriage at 25 Four years ago she began to go out as a daily maid to ease the financial strain of three growing children In 1936 she was "run down" and had menorrhagia She has found her work exhausting in the past year (1937) and is "getting nervous again like when I was small I've not been myself since January—I was laid up for three weeks then with a bad cough" She wakes up with a jump very often and is not getting enough sleep "since the summer" Always an active tidy woman, "like mother," she "finds books bore her" She "wants to be doing something but hasn't had the strength in the past year" In December, 1937, she began to have epigastric pains and "went off her food" This made her feel "even less fit for work" She found it particularly trying to hurry home to make the children's midday meal and then back to work and then home to do her own work and make the evening meal She has been on a very light diet since Christmas," and on her 39th birthday she had a hæmatemesis "After I'd brought it up I felt better than I had done for months"

This "negative history" is from the group of 11 in whom we could find no precipitating event preceding the hæmorrhage The histories, however indicate common characteristics which antedated dyspepsia and hæmorrhage in 10 of these patients In other words, 10 out of the 11 showed symptoms of some increase of long standing emotional stress in the period preceding the hæmorrhage

Table I shows the results obtained in the 50 persons observed.

TABLE I—58 HÆMATEMESES IN 50 PATIENTS

Age-group	Events related to—				No events			Total
	Work	Money	Illness	Other	Precedent emotional stress		Total of last two columns "No events"	
					Present	Absent		
20–29	3	1	0	0	0	0	0	4
30–39	5	4	4	0	2	1	3	16
40–49	2	1	1	2	5	0	5	11
50–59	6	7	5	3	3	0	3	24
60–69	0	3	0	0	0	0	0	3
	16	16	10	5	10	1	11	58

Perforation

Employing identical methods we found much the same personality types and precipitating situations in 25 patients with perforated peptic ulcers. In 16 out of the 25 there had been an outstanding event in the patient's life which we felt could be regarded as capable of producing acute emotional stress In the remainder there was little doubt that, although no "acute" events could be found, symptoms of emotional stress, long antedating dyspepsia, were present

CASE 13.—A housewife, aged 30, outwardly calm and balanced, who describes herself as "always worrying inwardly and much more in the last year." She "can't sit still and can't bear to have anything not spotlessly clean." She is "rather sensitive about friends" She had never had any indigestion until the day after the funeral of her husband, who died from silicosis and tuberculosis. On the second day after the funeral she perforated.

CASE 14.—A railway worker, aged 49, with one girl, aged 12 His father and mother were "always out in pubs," and a sister and he ran the home together. In 1923 he began main-line firing on the railway and often would be eleven hours without a meal, with only the company's lodging house at the other end. Since 1936 his wife has been changing and now seems to be both menopausal and paranoid. "As soon as I came home I would see in her eye that her mind had gone. Then she was taken away (to a mental hospital)." "She came home a week before I had this perforation"

TABLE II—SUMMARY OF EVENTS PRECEDING PERFORATION IN 25 PATIENTS

Events related to—					No events		
					Precedent increase in symptoms of emotional stress		
Work	Money	Illness	Other	Total	Present	Absent	Total
2	5	5	4	16	9	0	9

As in the hæmatemesis group, we found the majority, 16 out of 25, showed some acute episode in their lives which preceded the perforation by a few days. In 9, however, although no such events were found, symptoms of long-standing emotional stress were observable Table II records our findings

Discussion

There must be several factors which determine whether an ulcer bleeds or perforates or does neither. The proximity of a vessel of some size, the frequency with which the eroding juice is buffered with food, sudden increase of intra-abdominal pressure by a large meal or a sudden bending of the body, for instance, might easily determine the onset of one of these complications There is, however, one point of common agreement: an ulcer that bleeds or perforates is *active* and erosion is gaining over repair, whether the ulcer concerned is no more than a mucosal erosion or a large indolent crater If the nervous system does play an important part in the ætiology of peptic ulcer, we should therefore obtain some supporting evidence in these two conditions of active ulceration It was for this reason we pursued our inquiry, and our results appear to provide the evidence

Patients often remark on their improvement after one of these catastrophes. Why should an ulcer which has perforated and has only been quickly sutured (often only with a flap of omentum loosely applied) cause so little subsequent anxiety? We cannot recall a single instance of a perforated ulcer in which the patient complained during his convalescence of symptoms indicating renewed activity of the ulcer. Why should a hæmatemesis so often end symptoms? In the latter condition radiography at the end of three weeks often fails to demonstrate an ulcer crater. The evidence points to a rapid healing following these major complications of ulcer. Does this fit in with the nervous origin of ulcer? As we show in our examples, these patients are harassed and worried by their responsibilities and by environmental changes When there is acute uncertainty whether they can get through a situation or not, to give in, to resign and admit defeat is incompatible with their make-up. But when blood is vomited there is a sudden change in affairs and an immediate alteration in their attitude to their difficulties. Their threatened failures are expiated Urgent treatment is called for and all other events become relatively unimportant. Wounded in the battle of life, there is an armistice and with it the possibility of a new orientation. The cares and worries of yesterday now seem relatively unimportant. It may be that this attitude of mind, this new outlook, does play some part in the good results which follow such urgent complications

The "acute" precipitating situations or events which we found to precede hæmorrhage or perforation were identical with those we already found to operate in the dyspepsia of uncomplicated ulcer. The time-interval was found to be a matter of days Tension produced by uncertainty in work and relating to money matters commonly dominates the picture, but illness of a member of the family or of the patient himself played a part in some instances The story of the sea captain illustrates the type of tension—the uncertainty in his mind, over a few days, whether he could land his cargo safely in port The nurse we quoted is a similar example—suddenly placed in what was to her a responsible job, there followed acute tension and the subsequent hæmorrhage Our figures are sufficient, we think, to implicate emotional stress and the nervous system in these two complications and, therefore, in the ætiology of peptic ulcer—for of 58 hæmatemeses 47 were associated with preceding acute tension, as were 16 of 25 perforated ulcers

If we are to accept the view of the ætiology of peptic ulcer implicit in these findings, there are corollaries in *designing* treatment Our practical therapy should include an attempt at prevention of these complications. In known ulcer patients avoidance of increased responsibility or of sudden changes

in responsibility and encouragement of a more even life with an abundance of time to execute each task may help in the right direction and during unavoidable stress and anxiety the frequent buffering of hyperacidity is rational But in our medical attempts at prevention by far the most important point, we consider, is to facilitate the conviction of the patient that his mind is capable of bringing distress to his stomach To the lay person the mind is often something encased in the head, far removed from the stomach That the one can influence the other is, to him, not always sound medicine, and it is surprising how reluctant some remain, in spite of repeated recurrences, to be convinced that there is an association Once, however, the patient accepts this relation, he can, we think, do much to put his house in order

Summary

(1) Events capable of producing unusual emotional tension were found to precede hæmatemesis and perforation in 63 out of 75 patients

(2) These events preceded the hæmorrhage or perforation by a few days and usually related to increase of responsibility, financial difficulty, and illness or trouble in the family

(3) The bearing of this evidence on the etiology of ulcer and on the treatment of the ulcer patient is briefly discussed

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HÆMORRHAGE IN PEPTIC ULCER

A REVIEW OF 241 CONSECUTIVE CASES

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THE orthodox management of hæmorrhage in peptic ulcer has recently been subjected to criticism, and dietetic methods of treatment have taken on a new interest in view of the admirable results obtained by Meulengracht (1935) and Witts (1937). Earlier and more liberal mouth feeding has been claimed to have many advantages over the older methods which often amounted to semi-starvation.

Hæmorrhage, the commonest complication of peptic ulcer, was present in 55.5 per cent. of the 434 hospital cases from which the material for this investigation was obtained. However, this proportion of bleeding is probably higher than that actually obtaining, for patients with peptic ulcers often do not seek hospital treatment until some complication asserts itself. Hurst and Ryle (1937) found that bleeding was present in 31.3 per cent. of a series of 1340 private cases of peptic ulcer, and this figure probably represents more correctly the incidence of hæmorrhage in peptic ulcer.

SELECTION AND ANALYSIS OF CASES

In view of the claims made for the new methods of treatment, it was decided to review all cases of peptic ulcer with hæmorrhage in a medical unit of the Western Infirmary of Glasgow, to ascertain the results obtained over a period of ten years (1929–38). During this period the unit treated 4818 patients, of whom 434 had peptic ulcers. Of the ulcer cases 241 (approximately 5 per cent. of the total admissions) had hæmatemesis or melæna or both (melæna being understood to mean the passage of tarry stools). Only cases showing definite clinical evidence of bleeding were included. No case was included in which the bleeding was due to malignant disease, hepatic cirrhosis, hæmopoietic disorder, gastrostaxis or poisoning. Of the 241 patients 145 had hæmatemesis, 60 melæna, and 36 both hæmatemesis and melæna.

TABLE I.—INCIDENCE OF HÆMORRHAGE IN PEPTIC ULCER

Main type of bleeding	Gastric ulcer	Duodenal ulcer	Gastrojejunal ulcer	Site not determined	Total cases
Hæmatemesis	35	69	3	38	145
Melæna	13	42	2	3	60
Hæmatemesis and melæna	11	23	2	0	36
Total	59	134	7	41	241

Table I shows how the cases were divided into four groups: 59 with gastric ulcers, 134 with duodenal ulcers, 7 with gastrojejunal ulcers, and 41 in which the precise situation of the ulcer could not be accurately determined by radiographic, operation, or autopsy findings. The case history has not been considered a sufficiently accurate guide to the type of ulcer present. Witts (1937) has shown how the provisional and proved diagnoses often differ. The group of undetermined site (17 per cent. of the total cases) supports the studies of Hellier (1934), who included in his series of 303 cases of hæmatemesis 72 of doubtful origin and 106 in which the history strongly suggested peptic ulcer but a radiogram was either negative or not obtained. Cullinan and Price (1932) found it possible to determine the exact site of the ulcer responsible for the bleeding in only 44 of 107 patients treated in St. Bartholomew's Hospital. Hurst and Stewart (1929) and Hurst and Ryle (1937) have pointed out that it is common to find no abnormality if radiography is postponed until three or four weeks after gastric hæmorrhage. They say that hæmorrhage appears to hasten healing of the ulcer.

In reviewing the factors concerned in the production of hæmorrhage in peptic ulcer, sex, age, and occupation have to be taken into account. With regard to the sex incidence, males accounted for 60 per cent. of the gastric group and 72 per cent. of the larger duodenal group. The incidence of gastrojejunal ulcer was entirely male. On the other hand, in the group of cases in which the site of the ulcer was in doubt, the incidence was almost equal (20 males and 21 females). It was noted in the gastric group that, whereas the males showed no significant variation due to age, most of the females were between 40 and 60, contrary to the old-established view that hæmat-

emesis was specially common in younger women These results are supported by the findings of Cullinan and Price (1932), who suggest that this may be related to the disappearance of chlorotic anæmia. In the duodenal group the maximal incidence for females was between 25 and 50, the males again showing no significant variation. In considering occupation it must be recalled that the more highly paid sedentary and professional workers were excluded, for the series consisted entirely of hospital patients Thus, in the male group only 11·5 per cent. were in sedentary employment—e g , clerks—whereas 37 per cent. were engaged in heavy manual work As might be expected, most (78 per cent.) of the females were employed in household duties.

GASTRIC SECRETION

Fractional test-meals were given to 191 of the patients investigated Hyperchlorhydria was found in 61 per cent.; 24 per cent were within normal limits on charts prepared after the standards of Bennett and Ryle (1921); 12 per cent had hypochlorhydria; and 3 per cent had complete achlorhydria These last figures are of special interest in view of the finding of Hurst (1935) that excessive secretion of mucus from a concomitant gastritis will reduce the acid level even in peptic ulcer. It is perhaps significant that, where the test-meal showed hyperchlorhydria and the site of ulceration was definitely established, there were 4 duodenal cases for 1 gastric case Table I shows a preponderance of duodenal over gastric ulcers of 2½ to 1 in contrast to this ratio of 4 to 1.

DIETETIC TREATMENT

During the earlier part of the decade under review the treatment of hæmorrhage followed the classical methods of gastric rest, as described by Willcox (1924) More recently, however, the regime was altered by shortening the semi-starvation period and giving the patient a diet of greater calorie value, of the type suggested by Hurst (1931)

Low-calorie intake.—The aim of this earlier method was to ensure complete rest of the stomach by withholding all mouth-feeding for two to four days after admission. Morphine sulphate gr ¼ was given by injection immediately and thereafter twice daily. Hæmorrhagic shock was combated by the administration of rectal saline with glucose On cessation of frank bleeding, 1 oz drinks of albumin-water were given every hour. On the next day the amount was increased to 2 oz. two-hourly, and a similar quantity of peptonised milk was given every alternate hour Thereafter the quantities were increased daily from an initial intake of 12 calories until on the eighth day of this diet the patient was receiving 1450 calories. At this point light diet was begun.

High-calorie intake.—During the last three years of the period under review the preliminary starvation has been shortened and in some instances omitted. The administration of morphine and rectal salines was found to be beneficial and was continued. Many of the patients received from the day of admission a diet of the type suggested by Hurst (1931) for acute ulcer (stage I) The food value of this recent method of treatment—namely, 2900 calories—shows a very substantial increase over the earlier diet scheme. After a variable period of at least three weeks a further increase in diet was permitted (Hurst's stage II), the caloric intake now being some 3500 calories a day. On discharge from hospital each patient was given a sheet of dietetic instructions

Bland diet.—From the beginning of the series in some cases, mainly of milder severity with melæna, an easily digested low-residue diet, having a calorie value of 2500 approximately, with alkalis and atropine, was given from the day of admission.

Table II shows how the admissions in this series were allocated among the different diet schemes and gives the number of deaths in each group. Of the 3 deaths after treatment with bland diet 2 were post operative and 1 due to repeated severe hæmorrhage five days after admission.

TABLE II—ANALYSIS OF DIETETIC TREATMENTS AND DEATHS

Dietetic treatment	Cases	Deaths
Low-calorie intake	165	20
High-calorie intake	44	0
Bland diet used for slight cases	53	3

Of the 241 patients in this series 20 were admitted with hæmorrhage on more than one occasion, making 262 admissions in all

EARLY SURGICAL TREATMENT

Surgical aid was sought in 8 cases in which medical treatment during the first two weeks after admission had not arrested repeated severe hæmorrhage one patient died before any operation was carried out, in another no lesion was found in the stomach or duodenum, and appendicectomy was performed, the patient making a good recovery, in a third case, a woman aged 45, a chronic lesser-curvature ulcer was invaginated, and subsequent pyloric stenosis led to gastro-enterostomy being performed successfully two years later; and the remaining 5 patients died, giving a recovery-rate of 2 in 7 operations In view of these disappointing results, which are in close accord with the findings of Cullinan and Price (1932) and Hurst and Ryle (1937), we feel that the part played by surgery in the early treatment of hæmorrhage from peptic ulcer is very small (Surgical intervention for perforation or for pyloric stenosis is not within the scope of this paper)

FATALITY-RATE IN HÆMORRHAGE FROM PEPTIC ULCER

Recent writings on hæmorrhage in peptic ulcer have shown considerable variations in mortality Meulengracht (1937), in Copenhagen, has claimed the excellent fatality-rate of 1·3 per cent. in a series of 368 cases treated with his full purée diet, and in a later series (Meulengracht 1939) 10 patients died out of 491. Chiesman (1932) has shown a figure of 25 per cent in 191 cases of gross hæmatemesis and melæna treated in St Thomas's Hospital Paterson (1923–24) expressed a generally held opinion when he stated that of patients who bled severely and were treated medically not more than 1 in 9 would die. The extreme variations in the statistics quoted by different authorities, which have been tabulated by Babey and Hurst (1936), are in part due to the differing standards adopted. Some have lowered the fatality-rate by excluding all deaths not directly due to bleeding from the ulcer, whereas others have raised it by excluding from their series the less severe cases with melæna only. Witts (1937) has pointed out that figures which are extremes from mass statistics have done little to clarify the issues as to treatment

There were 23 deaths in this series of 241 patients, giving a fatality-rate of 9 54 per cent. In arriving at these figures, all deaths have been included Thus, among the 23 fatal cases there are 5 in which death was due to some postoperative complication. surgical shock 3, pneumonia 1, and paralytic ileus 1. There have been included, in the patients treated medically, 3 who died with pneumonia, 1 with cerebral thrombosis, 1 with malignant hypertension, and 1 s

chronic alcoholic All these cases have been incorporated in our total of 23 deaths, because bleeding from peptic ulcer led to their admission to hospital Had these cases been excluded and the fatality-rate expressed in terms of patients actually bleeding to death in medical wards, the figure would have been much lower (4 98 per cent), but it seemed more informative to consider the total fatality rate from all causes, as was done by Cullinan and Price (1932) in their careful review of hæmatemesis

The patients who died included 20 males and 3 females the average age at death being 51, and most of them had had symptoms of long duration Of these patients 11 had gastric ulcers 5 duodenal, and 1 a gastrojejunal ulcer, and in 6 the site of the ulcer was not determined Of cases with operative or autopsy proof, acute ulcers were found in 3 and chronic ulcers in 8 (in one instance both varieties were present) The site of all the fatal chronic ulcers was either on the posterior aspect of the lesser curvature of the stomach close to the pylorus or on the posterior wall of the first part of the duodenum These ulcers were closely related to the gastro-duodenal and right gastric branches of the hepatic artery Apart from three postoperative deaths there had been repeated hæmorrhages in all the fatal cases No patient in this series died from a single hæmorrhage

Duration of bleeding.—Whatever the type of treatment employed, no significant variation in the duration of bleeding after admission to hospital was noticed in either sex In this series the average time taken for the fæces to become negative to tests for occult blood was twelve days Meulengracht (1935) has pointed out that hæmorrhage does not necessarily take place during the whole of this period An intravenous injection of normal saline was given in 5 cases and in 14 the severity of the bleeding necessitated blood transfusion

TREATMENT OF THE ANÆMIA

In this paper no attempt has been made to compare the value of the different preparations of iron on any accurate basis The anæmia which results from hæmorrhage in peptic ulcer does not lend itself well to such a study Thus the remarkable powers of recuperation shown by a healthy hæmopoietic system after a single hæmorrhage are well demonstrated by the case of a young adult whose hæmoglobin percentage after hæmatemesis was 43 and rose to 73 in thirty-five days without any iron medication Various preparations of iron were used during the ten year period under observation Of these injectio ferri (Moltens) which was used to some extent in the earlier years, was found to be of negligible value For example a patient was given thirty two daily injections with an increase in hæmoglobin of only 7 per cent Other preparations used were iron and ammonium citrate and the saccharated carbonate of iron. These both gave excellent results, as the following typical cases show —

(1) A man received gr 90 of the scale preparation daily for twenty-two days his hæmoglobin rising from 37 to 68 per cent

(2) With gr 90 of the saccharated carbonate of iron daily a rise of 15 in the hæmoglobin percentage took place over a period of thirty five days

CONCLUSIONS

In the present series in which deaths from all causes have been considered the fatality rate is 9 54 per cent Three types of treatment have been employed during the decade under observation The fatality-rate in the 165 cases treated with the original low calorie intake diet was 12 1 per cent Throughout the ten year period under review patients with massive hæmorrhage were usually treated by this method The 53 cases treated with bland diet had a fatality rate of 5 6 per cent There were no deaths in the 44 cases treated with the recent high calorie intake In an endeavour to assess the value of this more liberal diet, the fatality rates in all types of cases have been contrasted before and after the beginning of its use A reduction from 10 8 to 6 15 per cent followed its introduction, the former figure being the fatality rate in 169 patients during the first seven years of the period under review It seems reasonable to conclude that more generous feeding is an important factor in assisting recovery from hæmorrhage in peptic ulcer

The extremely low recovery rate after operations—2 in 7 in this series—indicates the extremely hazardous nature of surgical intervention in recent hæmorrhage in peptic ulcer Moreover, as happened in one of our surviving cases, no definite bleeding point may be found at laparotomy Consequently, the function of surgery in hæmorrhage from peptic ulcer appears to be very limited

SUMMARY

(1) A series of 241 consecutive cases of hæmorrhage in peptic ulcer has been reviewed, mainly from a therapeutic aspect The patients were divided into four groups 59 with gastric ulcers, 131 with duodenal ulcers, 7 with gastrojejunal ulcers and 41 in whom the precise situation of the ulcer could not be accurately determined Males accounted for 60 per cent of the gastric ulcer group and 72 per cent of the larger duodenal group

(2) Hyperchlorhydria was present in most (61 per cent) of the patients, but 12 per cent had hypochlorhydria and 3 per cent complete achlorhydria

(3) Recovery rates after operation have shown that the part played by surgery in the treatment of hæmorrhage in peptic ulcer is very small

(4) In this series the fatality-rate from all causes was 9 54 per cent In the earlier part of the period under investigation when the treatment given was the classical low calorie intake, the fatality-rate was 10 8 per cent in 169 patients, but after the introduction of more generous diets the figure fell to 6 15 per cent in 72 patients None of those treated with the newer high-calorie intake (Hurst's diet schemes) died

(5) The majority of the fatal cases had chronic ulcers in the pyloric region, either on the posterior wall of the stomach (11) or of the duodenum (5) vessels having been eroded All the patients that died had had hæmorrhage more than once

(6) In the treatment of the consequent anæmia excellent results followed the administration of iron and ammonium citrate, or the saccharated carbonate of iron, in large doses, but remarkable recuperation of blood may follow a single hæmorrhage, without any iron being given Injections of iron were almost useless

Our sincere thanks are due to Dr George A Allan, who suggested this investigation, placed his case records at our disposal, and greatly helped us with advice and criticism, and to Miss F Rose, sister-dietitian in the Western Infirmary, for her valued supervision of the diet schemes

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LATE SEQUELÆ OF PULMONARY EMBOLISM

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FROM a clinical point of view pulmonary embolism is rarely if ever regarded as the cause of chronic disease The usual picture is that of a more or less acute illness which passes fairly quickly from one episode to another and ends in either death or recovery in a matter of days or weeks. Yet a careful study of the pulmonary arteries at many autopsies makes it clear that we have sometimes to reckon with long-standing lesions and morbid processes which appear to be the result of emboli lodged in the lungs months or even years before death

For want of a better term the condition which I propose to describe may be called "chronic embolisation of the pulmonary arteries" I have collected four representative cases which illustrate the progressive phases of this morbid process The first patient survived for three or four months and the others for longer periods up to six years or more. The nature of the lesions became apparent only at autopsy Then it seemed evident that what were probably embolic seizures had been regarded clinically as heart attacks or, if the lung was infarcted, as pneumonia The diagnosis was rendered the more difficult during life by the lack of any manifest source of emboli My colleague Dr Paul Wood has now had some success in recognising this type of case clinically and will shortly report his findings. Only a brief outline of the clinical histories is given here My main object is to describe certain unusual lesions of the pulmonary arteries and to show that they are of embolic origin.

CASE-RECORDS

CASE 1.—A tall robust young man, aged 28, previously healthy, injured his left knee in a motor accident The wound became infected, and the thigh had to be incised for the drainage of pus, but after five weeks recovery seemed more or less complete. Thereafter he suffered recurrent attacks of pulmonary embolism with pleuritic pain and bloodstained sputum. There were three or four episodes of increasing severity at intervals of some weeks before the fatal seizure five months after the injury.

Autopsy.—Much dilatation and some hypertrophy of the right ventricle Evidence of congestive heart-failure. Large emboli, old and recent, of pulmonary arteries (fig 1). Old and recent thrombosis of left iliac veins. No septic focus found in relation to the thrombosed veins.

Earlier post-mortem investigations on pulmonary embolism have made it abundantly clear that migration of venous thrombus to the lungs is seldom confined to a single event but tends to recur (Belt 1934) In most instances there are multiple emboli, and it is usually obvious that they have migrated at intervals rather than all at once. Case 1 is an example of recurrences over a period of three or four months. The emboli apparently arose from a long-standing subclinical thrombosis of the left internal and common iliac veins This thrombosis was probably a sequel to the injury of the left leg, but the causal relationship was no longer apparent. Three of the larger emboli may be seen in fig. 1. They are numbered in the apparent order of their occurrence. The first (1) is a firmly adherent tough contracted mass of organising clot which practically occludes the right lower branch It is partly recanalised and would correspond to one of the earlier seizures, probably three months before death The second (2), which is firmly adherent to the vessel wall and partly bleached though not yet contracted,

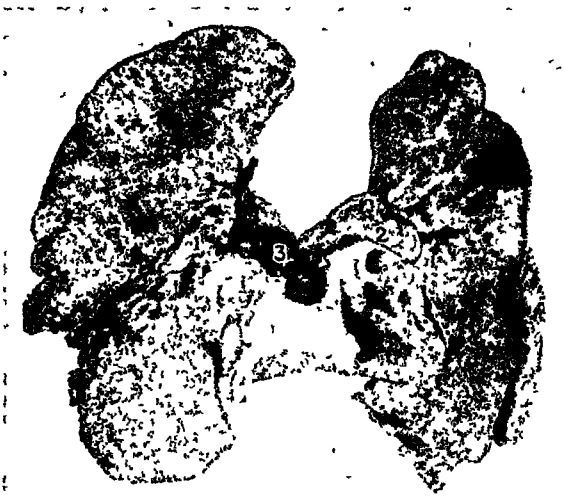

FIG 1—Lungs and main pulmonary arteries of case 1, showing three large emboli numbered in the order of their occurrence · (1) probably two or three months old and so far organised as to be tough and contracted, (2) firmly adherent, partly organised, probably six weeks old; and (3) recent (Pathological museum, British Postgraduate Medical School)

might be six weeks old The third embolus (3) caused death within a few minutes. The degree of obstruction occasioned by these emboli had had an obvious effect on the right ventricle. It was not only dilated but also hypertrophied, and the abdominal viscera showed chronic vascular congestion. Had this patient escaped the final embolism he might well have developed the same sort of picture as that of case 4.

CASE 2.—Female, aged 77, died on April 4, 1933. An anæmic old lady with effort dyspnœa and periodic swelling of feet for two years Recurrent attacks of pleural pain and weakness for about six months In hospital from Nov. 1 to Dec 20, 1932, treated for coronary disease of heart complicated by bronchopneumonia Readmitted on Feb 25, 1933, with air-hunger, having suffered two sudden painless attacks of faintness and suffocation a short time previously. Gradual decline with congestive heart-failure

Autopsy.—Heart weighed 300 g The pericardium was adherent, the right heart much dilated Secondary branches of pulmonary arteries practically all occluded with old and recent emboli (fig. 2) which had arisen from a silent thrombus in right external iliac vein. Several small hæmorrhagic infarcts of the lungs with associated pleurisy.

Here there were too many complications to afford a good general picture of the late results of embolism, but the case is noteworthy for certain morbid ana-

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tomical features which make it possible to trace the fate of an embolus through various stages of organisation to its ultimate cicatricial state The structure marked (1) in fig 2 would scarcely be recognised as an embolus except in the company of the later arrivals, for it has been transformed into a tough white cord like structure It has a three-cornered attachment, its ends are secured to the wall of the larger vessel, and its middle to the promontory of an intervening bifurcation Its length lies more or less parallel to the direction of the main blood stream Microscopically it has the character of a fully organised blood clot The surface is covered by an indistinct endothelial membrane and slightly roughened by a few minute deposits of platelet thrombus Here and there throughout the mass are clusters of hæmosiderin pigment, a point of some importance to be discussed more fully in the account of the next case

CASE 3.—A stout blind man, aged 48, who died on Feb 5, 1939, with heart failure a few days after surgical repair of a congenital diaphragmatic hernia Little is known of his previous history except that he had had effort dyspnœa for some months

Autopsy.—Postoperative paralytic ileus Cor pulmonale with chronic vascular congestion of viscera Fibrous stenosis of pulmonary arteries, possibly due to organised emboli (figs 3 and 4) Left femoral and popliteal veins scarred and trabeculated like the vein in fig 7 No recent emboli were found

At first sight the peculiar changes in the pulmonary arteries of this case are not easily recognised as of embolic origin Each lesion consists of a fibrous cord like structure attached only at its extremities, so that its length is suspended tightly but freely in the lumen of the vessel, more or less parallel to the direction of the main blood current It is similar to the older lesions in the preceding case Under the microscope the appearances are those of an organised clot with rich deposits of hæmosiderin These fibrous bands must be but a fraction of the size of the original clot The contraction which they have undergone has puckered the vessel and reduced

FIG 2—Part of right lung of case 2 showing secondary divisions of pulmonary artery with four emboli numbered in the order of their occurrence (1) solid, white, fibrous, probably six months old, (2) partly organised, (3) and (4) recent (Pathological museum, Banting Institute)

the lumina, particularly in the tertiary branches, producing a good deal of obstruction, which had caused a notable hypertrophy of the right heart The primary and secondary divisions of the pulmonary arteries were dilated, rather inelastic, and flecked with fatty streaks, probably as a result of pulmonary hypertension

It might well be asked, Was not the original clot autochthonous rather than embolic? The answer is in the negative for the following reasons: (1) the

FIG 3—Part of right lung of case 3 showing secondary divisions of pulmonary artery with one large fibrous cord (stretched over forceps) representing a completely organised blood-clot

FIG 4—Part of left lung of case 3, showing secondary divisions of pulmonary arteries with numerous trabeculæ representing organised clots Many are deeply coloured with old blood pigment Tertiary divisions scarred and stenosed

FIG 5—Part of left lung of case 4 showing pulmonary artery to lower lobe (hilus held open with match A) with puckered trabeculated scar apparently representing result of embolism six years earlier

lesion conforms to the pattern of an old embolus as seen in the previous case; (2) it is attached only at its ends to the arterial wall, whereas an autochthonous thrombus might be expected to be more sessile, (3) the location of the lesion corresponds to that where emboli commonly lodge; (4) the slender elongated form suggests that the original clot was cylindrical like an embolus; (5) its orientation suggests that it was originally a loose-lying clot whipped out in the direction of the blood-stream; (6) there is no obvious intrinsic cause for thrombosis in these vessels; (7) similar organised clot was found in the leg veins, providing proof of a potential source of embolism; and (8) there is strong evidence to show that embolism is many times commoner than autochthonous thrombosis of the pulmonary arteries (Belt 1939b)

The lesion which we regard as an organised embolus is not necessarily static. There may be microscopic deposits of secondary thrombus on its surfaces These tend to recur and undergo organisation somewhat like the verrucose vegetations of rheumatic heart-disease and may lead to progressive scarring; or there may be extensive development of secondary thrombus, as in case 4.

CASE 4.—A stout plethoric female, aged 67, chronic alcoholic, with congestive heart-failure, died unexpectedly on Dec 11, 1934, shortly after a sudden painless seizure of breathlessness. Six years earlier she had had a similar seizure, which was diagnosed as a heart attack and followed by an illness regarded as pneumonia. Since then she had been weak, short of breath, cyanosed, and subject to swelling of the feet and ankles

Autopsy.—Cor pulmonale, old scarring of pulmonary arteries (fig. 5), recent emboli of tertiary branches, and a large plaque-like thrombus of right main branch (fig. 6) The emboli had arisen from leg veins, which showed old and recent thrombosis (fig 7). The lungs were not infarcted

FIG. 7—Right femoral vein of case 4, showing cicatricial trabeculation, thickening, and distortion due to organised thrombus Recent thrombus in lower part had given rise to fresh emboli.

This is the type of case which best exemplifies the late sequelæ of pulmonary embolism. The clinical picture was not unlike that of Ayerza's syndrome. The right ventricle was as large and almost as thick-walled as the left (fig 6), affording a good example of cor pulmonale There was extensive scarring of the larger pulmonary vessels, which probably dated back six years to the serious illness recorded in the history Here the scar consists of a tangled contracted network of fibrous trabeculæ (fig 5)

Again it may well be asked, Why is this lesion to be regarded as embolic? The answer is, For the same reasons as advanced in the preceding case Here there is even less doubt, for the fatal issue was determined by embolism

The large plaque-like thrombus half filling the right pulmonary artery (fig. 6) is of some duration and has its roots in an old scar similar to the scar on the left side pictured in fig 5 It is not difficult to see how such scars as these might result from the organisation of large emboli like those in case 1, the location is more or less the same in both cases —namely, just inside the hilus

FIG 6—Heart and lungs of case 4, showing large tongue-shaped thrombus half filling right pulmonary artery; dilatation of pulmonary trunk, and hypertrophy of right ventricle. (Pathological museum, Banting Institute.)

DISCUSSION

Cord-like scars in the pulmonary arteries similar to those described have been observed in a few instances by others Zahn (1889) recorded one case with a peculiar web-like fibrous lesion which he regarded as a congenital anomaly Saphir (1932) saw the condition twice and took it as evidence of organised thrombus He thought the thrombus had been autochthonous, due to atheromatous change, though he said he could not be sure that it was not embolic It is perhaps significant that Zahn's patient and one of Saphir's died of pulmonary embolism.

Like Møller (1922), who observed the lesion in 4 cases, I have little doubt that it represents a late result of embolism In routine autopsies one sees so many emboli of the lungs (Belt 1939a), if one is on the look-out for them (emboli which, for the most part, are undiagnosed clinically), and so few cases of primary pulmonary thrombosis that, when it comes to a question of deciding between the two, I always think of embolism first, though I am well aware that this is not the common teaching Of my 4 cases probably no one will doubt that the first 2 are examples of recurrent embolism. Concerning the others there may be some question, but I have tried to show how the emboli in the first 2 may have their counterpart in the older lesions of the second 2, and I have proved a potential source of embolism in all.

Case 4 might well have been regarded as an instance of primary pulmonary thrombosis, if a careful dissection of the pulmonary arteries and peripheral veins had not been made The recent emboli and the long-standing venous thrombosis might easily have been overlooked. Of all the cases of pulmonary thrombosis collected by Fowler (1934) one may wonder what proportion of them would have shown evidence of an embolic origin if it had been sought.

Among the few people to suggest an embolic background in cases of this type are Møller (1922) and Ljungdahl (1928)

If our interpretation be correct recurrent embolism is a possible cause of chronic pulmonary obstruction and cor pulmonale Some cases of Ayerza's disease may perhaps also be explained on this basis It seems to me that stenosing lesions of the pulmonary arterioles, usually regarded as a form of endarteritis obliterans, may sometimes be caused by minute embolisms recurring perhaps over long intervals, but I put this observation merely in the form of a suggestion

SUMMARY

After a non fatal attack of pulmonary embolism recovery is not always complete Not only does the embolism tend to recur but also organising emboli may produce cicatricial stenosis of the pulmonary arteries and lead to secondary thrombosis

Four cases are described which purport to show how these sequelæ of pulmonary embolism may sometimes cause a chronic illness by producing progressive pulmonary obstruction

Recurrent thrombo embolism may arise more or less de novo without antecedent illness and without obvious thrombophlebitis

I am indebted to Prof Duncan Graham, of Toronto and Sir Frederick Menzies, chief medical officer of health for the county of London, for permission to publish these case-records, and to Mr E V Willmott and Miss M H Shaw for the care they have taken with the photographs

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DURATION OF LABOUR IN PRIMIPARÆ

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THE effect of various factors on the duration of labour is one of the questions uppermost in the mind of anyone controlling the administration of analgesics and anæsthetics in labour The many inquiries that have been made are for the most part incomplete and not comparable, the probable error of the mean not having been calculated

An analysis has here been prepared of the duration of the first and second stages of labour in 1400 consecutive primiparæ delivered by the vaginal route (including forceps cases) in the obstetrical and gynæcological unit of the Royal Free Hospital from January, 1935, to December, 1937 The ages of the patients range from sixteen to forty five years, and, as can be seen in table I nearly two fifths were between twenty four and twenty seven Only 3 5 per cent were under twenty, and 6 5 per cent were over thirty three For the present purpose those between eighteen and thirty nine have been divided into two year age groups

In fig 1 the average lengths of the first and second stages taken together and of the second stage alone are shown graphically The graph seems to support the popular belief that the younger the mother the shorter the labour, thus agreeing with De Lee (1933) Nathanson (1935), Duchman (1932), Miller (1931–32), and others When, however, the differences between the means (see table II) and the standard errors of the differences between the means for the duration of labour for each age group are estimated, it is found

TABLE I—DISTRIBUTION OF CASES ACCORDING TO AGE

Age last birthday	Number of cases			Total	Per cent
	1935	1936	1937		
16–17	—	—	—	6	0 4
18–19	12	19	12	43	3 1
20–21	44	42	32	118	8·4
22–23	58	77	60	195	13 9
24–25	66	88	105	259	18 4
26–27	71	106	92	269	19 2
28–29	64	75	77	216	15 3
30–31	25	52	54	131	9 4
32–33	23	22	30	75	5 4
34–35	17	17	15	49	3 5
36–37	3	7	10	20	1 4
38–39	6	3	4	13	0 9
40–45	—	—	—	9	0 7
			Total	1403	—

TABLE II—DISTRIBUTION OF DURATION OF LABOUR AT DIFFERENT AGES

Duration in hours	Ages										
	18–19	20–21	22–23	24–25	26–27	28–29	30–31	32–33	34–35	36–37	38–39
2–7	6	11	25	19	32	22	14	6	1	1	1
8–13	12	45	59	84	68	56	30	17	11	5	3
14–19	5	14	38	54	63	34	19	14	11	4	2
20–25	10	20	19	34	35	20	25	10	8	2	—
26–31	5	8	14	30	17	17	12	9	5	3	2
32–37	2	4	12	10	14	14	11	4	1	2	—
38–43	—	5	9	8	11	21	2	4	5	1	2
44–49	—	3	0	5	8	4	5	4	1	—	1
50–55	—	1	4	4	8	5	6	3	1	—	—
56–61	1	—	2	4	2	1	2	1	2	—	1
62–67	—	1	3	2	4	5	1	—	—	—	1
68–73	—	—	—	2	1	2	2	1	—	1	—
74–79	1	1	—	2	1	2	—	1	2	—	—
80–85	1	1	—	1	1	1	1	—	—	1	—
86–91	—	—	—	—	2	—	—	—	—	—	—
92–97	—	1	—	—	—	1	—	—	1	—	—
98–103	—	—	—	—	—	1	—	1	—	—	—
104–109	—	—	1	—	2	—	—	—	—	—	—
110–115	—	—	—	—	—	—	—	—	—	—	—
116–121	—	—	—	—	—	1	—	—	—	—	—
122–127	—	—	—	—	—	—	—	—	—	—	—
128–133	—	—	—	—	—	—	1	—	—	—	—
Totals	43	115	195	259	269	216	131	75	49	20	13
Mean	20 1		21 1	21 1	22 1	24 1	24 5	26 2		27 5	
S M	1 3		1 1	0 9	1 1	1 3	1·6	1 7		3 4	

S M = standard error of mean

that the difference in duration from one age-group to the next is not statistically significant But if the duration in one age-group is compared with that in a group separated from it by several years the difference becomes slightly significant

The correlation between age and duration of labour is low but definitely positive ($r = +0.12 \pm 0.02$) This fits in with the experience of Berkeley and Bonney, though they say that the increase is only slight after the age of thirty. Frey (1933), Frey and Maeder (1933), Quigley (1931), and Calkins, Irvine, and Horsley (1930) do not admit that age has any influence on the course of the first and second stages Calkins, however, was investigating a group consisting of multiparæ as well as primiparæ, whereas we are there dealing with primiparæ only. Also their series was even smaller than ours (1250) They found no evidence of correlation between age and length of labour, and conclude that the only important factor is parity.

All the patients in our series received analgesics, such as potassium bromide, gr. 30, with chloral hydrate, gr 30, and gas and air by the Minnitt apparatus; a small proportion received drugs of the barbituric acid group, Opoidine or rectal ether, during labour. Many patients were of the highly nervous type

It is thus interesting to compare the average length of labour in this series with that reported by others Quigley (1931) found that the average length of labour in 300 patients of thirty and over was 17 hours. Roeder (1937), who considers patients of thirty-five and over elderly, found that in 113 such cases the average length of labour was as low as 13 hours 9 min. In Nathanson's (1935) series of 186 cases aged between thirty-five and forty-six, the average was 18¾ hours. Daichman (1932) grouped those aged thirty-eight to forty-four as elderly and found that the average in 48 such patients was 22½ hours. Douglas Miller (1931–32) found the average in 88 cases of forty and over was 21½ hours

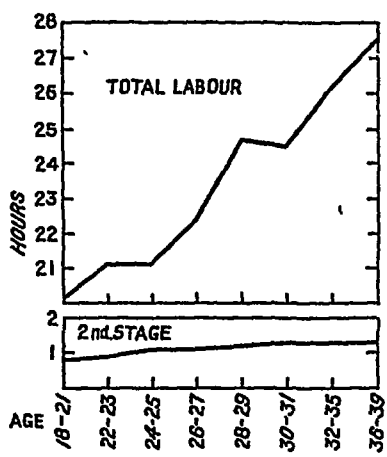

FIG. 1—Average length of total labour (above) and the second stage (below) in age-group.

The average length of labour of all the patients between the age of eighteen and thirty-nine in the present series was higher, being 23 hours 39 min. But if we take, for example, the group of patients aged twenty-four to twenty-seven (nearly two-fifths of the total) we find that 65 per cent. of these had a considerably shorter labour than the average, which for this group was 22 hours, and half the patients had labours lasting between 7 and 18 hours This is illustrated in fig 2, where the peak on the graph, or, statistically speaking, the mode, is at 13 hours.

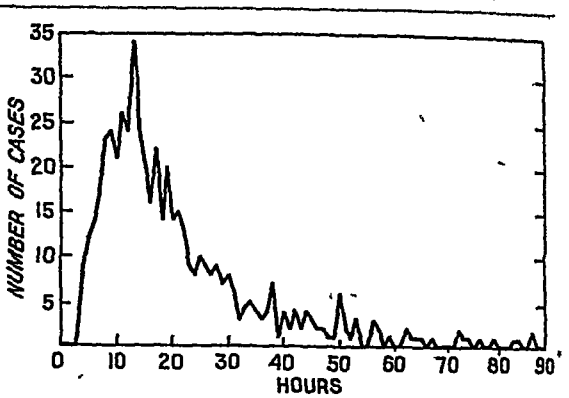

FIG 2—Distribution curve of length of total labour in patients aged 24–27

SUMMARY

In 1400 consecutive primiparæ delivered by the vaginal route, all of whom received analgesics during labour, there was a low but definitely positive correlation between age and duration of labour

The average length of labour of those between the ages of eighteen and thirty-nine was 23 hours 39 min Half the patients had labours lasting less than 20 hours

I am indebted to Prof Amy M. Fleming for her help with this work

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BLOOD COMPLEMENT IN ACUTE GLOMERULONEPHRITIS

AND TOXÆMIA OF PREGNANCY

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MANY claims have been made that blood complement is reduced in amount in several diseases

Paul and Pélyi (1935) described a slight fall in complement in allergic states, but the alteration was not great and was not found by Tilden (1934) More pronounced disturbances of complement activity have been described in yellow fever by da Costa Cruz (1929a and b), and this was not due to anticomplementary activity. Goldner (1929) concluded that complement was reduced in amount in all diseases involving extensive damage to the liver, and slight reductions have been described in eclampsia by Goldschmidt-Fürstner (1931) Slight alterations have been described in acute rheumatism by Veil (1932) and by Veil and Buchholz (1932) and in pneumonia by Dick (1912). In most of the above instances the disturbance was insignificant, and very few investigators made any examination of the range of complement activity in normal people.

A very pronounced disturbance in complement activity is found in acute nephritis (Gunn 1914, Kellet 1936, Kellet and Thomson 1939), and this fact may throw some light on its ætiology. Longcope (1929) and his co-workers have observed that the skin reactivity of patients with glomerulonephritis to filtrates of cultures of hæmolytic streptococci is very much greater than in other forms of streptococcal infection, such as uncomplicated tonsillitis. According to Friedemann and Deicher (1928) the blood of patients with postscarlatinal glomerulonephritis contains a greater concentration of antibodies than does the blood in non-nephritic cases of scarlatina at a comparable stage of convalescence. Further, acute glomerulonephritis has been produced in rabbits by a nephrotoxic serum (Masugi 1933, 1934, Arnott, Kellar, and Matthew 1936). The clinical, bacteriological, and experimental evidence, therefore, appears to indicate that diffuse glomerulonephritis is due either to a greatly exaggerated acquired sensitivity of the kidneys to the products of the streptococcus or to the effects of an exceptionally vigorous antibody-antigen reaction, such as might take place during the period of regression of the infection.

It has been suggested, apparently on comparatively little evidence, that pre-eclamptic toxæmia and eclampsia are also due to a similar type of reaction. Pregnancy toxæmias and acute nephritis have several points in common: both of them are associated with albuminuria, hypertension, and œdema, and both tend to progress towards a hypertensive encephalopathy. There are also glomerular changes in eclampsia which, however, are much less pronounced than in glomerulonephritis (Baird and Dunn 1933, Kellar, Arnott, and Matthew 1937). In the light of these known similarities between acute glomerulonephritis and eclampsia an attempt has been made to determine whether the similarity includes a reduction in blood complement. For this purpose many normal people were examined to establish the normal range of blood complement, which was then examined in cases of acute nephritis, healthy pregnancy, pre-eclamptic toxæmia, and eclampsia.

TECHNIQUE

Various amounts of serum were added to 0·5 c.cm. of a 3 per cent. suspension of sheep's red cells sensitised by the addition of 7 M.H.D. of hæmolytic antibody. The range of serum examined was 0·02, 0·04, 0·06, 0·08, 0·1, 0·15, 0·2, 0·4 c.cm., and the activity was taken to be represented by the reciprocal of the smallest amount of serum producing complete lysis of the cells after incubating the mixtures for two hours at 37° C.

So that the results of all the tests done over a given period should be comparable, a preserved complement was titrated with every batch. According as the activity of the preserved complement varied with the suspension of cells used, adjustments, usually slight, were made in the activities of the complements under test.

RESULTS

The complement content of the blood of 126 normally healthy patients in hospital for some minor gynæcological condition was observed. In this control series complete hæmolysis of the test amount of cells was obtained with 0·2 c.cm. or less of serum in 122 patients, and in the remaining 4 patients 0·4 c.cm. of serum was necessary to produce complete lysis. In these 4 there was obvious partial lysis with 0·2 c.cm. and with 0·1 c.cm., although 0·4 c.cm. was the amount required to produce complete lysis.

Acute nephritis.—Of 18 patients with acute glomerulonephritis 5 had their blood complement estimated once, 3 twice, and the remaining 10 three or more times. Of the 5 patients examined only once 1 showed a normal complement content, and of the 3 examined twice 1 showed a normal complement. In each of the remaining 16 a reduction of complement was found. In many instances there was apparently no complement present at all, but there was no obvious correlation between complement content and any of the clinical features, such as albuminuria, hypertension, and fever. In 2 cases a complete absence of complement activity was found on the same day that the blood-urea was normal, showing that the absence of complement was not due to an inhibition of its activity by retained nitrogenous substances. In another case the blood showed only the slightest trace of complement long after the patient had been discharged as cured.

Pregnancy control series.—Complement estimations were carried out on the blood of 157 women at all stages of pregnancy, and all showed a normal activity.

Pre-eclamptic toxæmia.—In 33 patients with typical pre-eclamptic toxæmia, characterised by hypertension, albuminuria, and œdema, who were examined on one or more occasions, no reduction in the complement was detected.

Eclampsia.—Repeated examinations were made on 8 cases of eclampsia during the convulsive phase, and no disturbance of blood complement was found.

DISCUSSION

We can therefore confirm the almost invariable reduction in complement in the blood in acute glomerulonephritis. There is apparently no alteration in the blood complement in pre-eclamptic toxæmia or in eclampsia. The similarity between acute glomerulonephritis and eclampsia does not, therefore, include this suggestion of a disordered immunity reaction. It appears likely that the similarity is due to the fact that they both share a widespread arteriolar spasm which is productive of hypertension, albuminuria, encephalopathy, and possibly œdema.

SUMMARY

Blood complement is reduced in acute nephritis, but there is no reduction in the toxæmias of pregnancy.

The work was done during the tenure of a Shaw Macfie Lang fellowship (W. M. A.) and a Kirk Duncanson fellowship of the Royal College of Physicians (G. D. M.). We wish to express our indebtedness to the Medical Research Council and the Earl of Moray Endowment for expenses grants. We are much indebted to Prof. D. M. Dunlop, Dr. T. J. Mackie, and Dr. R. W. Johnstone for their advice and encouragement and to the physicians of the Royal Infirmary and the Royal Maternity Hospital for access to patients under their care. We are also grateful to Dr. W. I. C. Morris, consulting obstetrician to Ayr county council, for samples of blood from cases of eclampsia.

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HÆMATURIA DURING TREATMENT WITH M. & B. 693

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AT the end of October, 1938, I began to treat native pneumonia cases with M. & B. 693. The ninth patient referred for this treatment was a boy of about 16 who presented signs of acute bronchitis and some suggestion of incipient bronchopneumonia. Although he did not seem to be altogether a suitable case for inclusion in what was supposed to be a trial series, it was decided to treat him.

CASE-RECORD

The boy was given 2 g. of the drug at 2 P.M., 1 g. at 6 P.M., 1 g. at 10 P.M. and no more until the following morning at 6 A.M., when he received another 1 g., making a total of 5 g. in 16 hours. When seen at 8 A.M. he was rolling about and calling out apparently in great pain. He was holding his hands to his suprapubic region and kept trying to pass urine. When he succeeded it was a mere bloodstained trickle, and the act seemed to cause pain. In addition to blood the urine contained an obvious white crystalline deposit, and a white incrustation formed about the urinary meatus. The patient was vomiting at intervals and appeared to have recurrent spasms of pain in the lower abdomen. He did not look toxic or seriously ill apart from his extreme discomfort. The pain was relieved by a small dose of morphia and hot applications, his M. & B. 693 was stopped forthwith and he was put on a potassium citrate mixture and encouraged to drink freely. He continued to pass small amounts of bloodstained urine during that day but the acute symptoms quickly subsided, and by the following morning the urine had increased to a satisfactory quantity and was progressively clearing.

The urine on the day of onset was strongly acid in reaction. Microscopically, the deposit showed masses of red blood-cells and crystals. These crystals, which were to become very familiar objects, resembled in shape the cross section of a fairly thick convex lens with a peripheral portion of one arc shorn off. They occurred singly or in formidable spiky agglomerations. On the second day the urine was light amber, somewhat opalescent, acid, and showed a trace of albumin; microscopically, red cells were still fairly numerous, and there were many crystals of the form described. Next day the findings were similar, except that the lenticular crystals were replaced by an occasional sheaf-like bundle of needle forms. Four days later the urine was relatively normal but still showed an occasional red cell microscopically.

These phenomena were at the time only tentatively ascribed to the effects of M. & B. 693, but the occurrence of similar cases soon put the matter beyond doubt, although it was puzzling that the complication did not seem to have been recorded in the growing literature. But it was not long before records began to appear. Robertson (1939) reports one such case; here crystals were not observed, and if the hæmaturia was accompanied by pain the patient was possibly insensible of it, being a severe meningitis case. Hanssen (1939) reports six pneumonia cases treated with M. & B. 693 with hæmaturia in one; he does not give the microscopic appearances of the urine. Adalja (1939) reports hæmaturia on the fourth day of treatment of a case in Nairobi, but only records red cells in the urinary deposit, again no mention of crystals. More recently Southworth and Cooke (1939) have reported three cases in considerable detail. In one crystals are mentioned as being absent in the urinary sediment, in the second crystals were present but are not described, and in the third there is no mention of crystals. Pain was a prominent symptom in these cases. These writers refer to the experimental work of Antopol and Robinson (1939) which evidently has an important bearing on the problem. They found that rats, rabbits and monkeys fed with sulfapyridine developed uroliths in the urinary tract.

FURTHER CASES

During the eight months October, 1938, to May, 1939, I treated 109 New Guinea natives suffering from pneumonia of various degrees of severity with M. & B. 693, of which 3 died before any significant amount of the drug could have been absorbed. Hæmaturia was encountered 13 times in these cases, and I also met with it in at least 3 other cases with which I was associated. The chief features of the cases are given in the table.

As a rule, about the third or fourth day of medication, but occasionally as late as the sixth day, the patient complains of lumbar, abdominal, suprapubic or penile pain, has some difficulty or pain with micturition and passes scanty urine more or less heavily tinged with blood; at times the specimen gives the impression of being more blood than urine. There is sometimes headache and vomiting a day or so before the onset of hæmaturia, and vomiting is a common accompaniment of the acute stage. In a few cases anuria has persisted for 12 or 14 hours and has caused some anxiety as to the ultimate outcome, but all have cleared up in 24 to 48 hours.

The treatment adopted consisted essentially in withdrawing the drug and getting the patient to take as much fluid as possible. A mixture of potassium citrate with tincture of hyoscyamus was used in most cases. In a few in which anuria threatened to persist a pint or two of hot saline was given into the rectum with apparent benefit. In a few cases 50 c.cm. of 50 per cent. glucose in Ringer's solution given intravenously seemed to have a good diuretic effect.

CRYSTALS IN THE URINE

After the first few cases of hæmaturia the urine of natives under treatment began to be inspected more frequently, and it became apparent that the majority of patients receiving amounts of M. & B. 693 of the order of 5 g. daily, sooner or later develop gross crystalline deposits in the urine. Often the urine is clear when passed but deposits crystals within half an hour. The crystals consist in most cases of the lenticular forms described, but in some instances the deposit has consisted almost entirely of sheaves of fine needles. In 2 cases in which the sheaves were filtered off a second deposit formed and this time was of the lenticular type. Both types of deposit give, after hydrolysis, deazotisation and coupling with dimethylalphanaphthylamine, the colour-reaction by which the presence of the sulph-

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SUMMARY OF HÆMATURIA CASES
(All were males)

Serial no. and age	Days of treatment before onset	Total M & B 693 given before onset (grammes)	Chief symptoms and urinary findings
1 (16)	1	3	Suprapubic and penile pain, pain on micturition White incrustation urinary meatus Urine scanty, strongly acid S G 1014, albumin + + fresh red cells lenticular crystals
2 (31)	6	26	Abdominal pain vomiting pain on micturition Urine scanty bloodstained, S G 1018 strongly acid albumin + red cells, lenticular crystals
3 (23)	4	18	Pain on micturition Urine scanty, blood-stained crystalline deposit red cells, lenticular crystals
4 (28)	5	27	Pain in loins and suprapubic region Urine scanty, at *times* 1 *or* 3 c cm, much blood red cells, lenticular crystals
5 (?0)	6	25	Abdominal pain, vomiting Urine scanty to suppressed much blood, heavy deposit of crystals red cells lenticular crystals
6 (26)	5	32	Abdominal pain Urine diminished dark red, alkaline (not fresh) faint spectrum hemoglobin no red cells lozenge crystals and phosphates Very mild transient Further course M & B 693 without recurrence
7 (26)	4	30	Penile and lumbar pain Urine scanty, partial anuria 2 or 3 days red cells lenticular crystals
8 (30)	3	18	Suprapubic pain Urine diminished, altered *blood in first sample later bright* blood strongly acid, red cells lenticular crystals
9 (22)	3	10	Headache, pain lower abdomen vomiting Urine scanty acid S G 1008, red cells, crystals
10 (19)	4	20	No subjective symptoms Urine microscopic blood and sheaves of lenticular crystals
11 (24)	4	20	Severe penile pain vomiting anuria for about 36 hours Urine much blood crystalline deposit
12 (18)	3	12 5	Mild suprapubic pain Urine diminished bloodstained crystals not seen
13 (14)	4	8	No subjective symptoms Urine diminished, blood present albumin + + +, no crystals noted

sulamide drugs is recognised When heated with alcohol and sulphuric acid an odour resembling acetic ether is given off The crystalline substance seems to be an acetylated conjugate of *M & B 693*

The occurrence of such crystals in freshly passed urine containing blood associated with symptoms suggestive of the presence of urinary calculi, inevitably leads to the supposition that the condition is a purely mechanical one caused by the deposition of the crystals in various parts of the urinary tract In this connexion the following case is of some interest, particularly in view of the experimental findings of Antopol and Robinson

An adult male native aged about 30 was admitted to hospital on April 1, 1939 He was said to have suffered from pain in the chest and cough beginning two days previously He did not appear ill His temperature was 99 6° F, pulse-rate 84, respirations 20 per min. Examination of the chest revealed rhonchi scattered over both sides but no localising signs of consolidation He was given no special treatment and remained in statu quo until the evening of the 3rd, when at 6 P M his temperature was 104 1° F, pulse 124 and respirations 48 The chest signs were much the same A blood-culture was taken at 10 P M and next morning showed a heavy growth of type 1 pneumococci Treatment with M & B 693 was then begun and 6 g was given daily for six days (1 g 4 hourly) Owing to vomiting, treatment was interrupted on the 10th, only 1 g being given on that day Dosage was recommenced on the 11th and continued, supplemented by 2 5 g intramuscularly on the 12th and 13th, until the patient died on the morning of the 18th In all, 52 5 g had been given. The blood was cultured daily from the 3rd to the 11th inclusive and was always positive On the 12th meningitis had declared itself by a sudden epileptiform convulsion, and the cerebrospinal fluid was turbid and contained viable type 1 pneumococci

Apart from the signs of purulent meningitis, somewhat congested lungs, and a hypertrophied left ventricle, the interest in the autopsy findings centred about the urinary system The kidneys were swollen and felt tense The right kidney weighed 195 g and the left 205 g On section the cortex of each was swollen and blurred and showed a few hæmorrhagic points The pelvis of both kidneys and both ureters were dilated and contained turbid brownish urine under some pressure Both ureters were dilated to a diameter of about 1 cm and were occluded at their point of entrance to the bladder by a small irregular, gritty and friable concretion about 9 mm by 7 mm The lining of the ureter underlying the concretions was congested and seemed to be slightly eroded There were, however, no signs of recent bleeding and the urine in the bladder showed no blood microscopically The sediment from the fluid in the ureter showed no crystals of the type described in the hæmaturia cases but only some spherical, brownish, radially striated bodies resembling urates The amount of free M & B 693 in the urine was estimated as 85 mg per 100 c cm That in the serum was 9 mg and in the cerebrospinal fluid 6 5 mg The concretion was composed of masses of long narrow rectangular crystals like stacks of sawn timber These were soluble in sodium hydroxide and reprecipitated by hydrochloric acid in somewhat modified and diverse forms, which varied according to the concentration of the solutions used Urate crystals were also present and the murexide test was positive Tests for the sulphanilamide compounds were positive, those after hydrolysis giving about a seven times greater concentration of colour than before Sections of the kidneys showed some desquamation and spoiling of the tubular epithelium, areas of round cell infiltration and scattered hæmorrhages The glomeruli were irregularly distributed and in parts crowded together There seemed to have been some antecedent chronic nephritis, and this was supported by the somewhat hypertrophied heart

On looking back over the somewhat inadequate clinical records of this case it was found that the daily urinary output had fallen from 950 c cm on the day after treatment was begun to 350 c cm two days before death little or none being recorded for the ensuing period There had been no gross hæmaturia and until the last two days no symptoms specially pointing to urinary involvement Unfortunately no investigations of renal function had been made

DISCUSSION

The relatively few instances of urinary complications recorded in connexion with the now large number of reports on M & B 693 treatment makes one consider the possibility of a special susceptibility in Melanesian natives As however these patients were treated under conditions which made it difficult to ensure an adequate fluid intake and no very systematic attempt was made to maintain a proper acid base equilibrium, further observations will be needed before assuming that there is any inherent difference in their capacity to conjugate the drug and excrete it in such concentrated form It has been shown

that the urine of such patients is highly acid (pH6 or less) and that the crystals are readily soluble in alkalis, so that it seems rational to adopt measures that will dilute and alkalinise the urine as a preventive

SUMMARY

In 109 cases of pneumonia in Melanesian natives treated with M. & B. 693 hæmaturia was found 13 times The hæmaturia was as a rule associated with characteristic crystals in the urine which were identified as a conjugated derivative of M & B 693. The suggestion is made that the hæmaturia is mechanical rather than toxic.

In a case without hæmaturia small calculi were found obstructing both ureters.

Fluids and alkalis should be given liberally when treatment with M. & B. 693 is adopted to prevent the deposition of crystals.

I am indebted to Dr E. T. Brennan, director of public health, Rabaul, for permission to publish this communication.

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LOBSTERS AND GASTRO-ENTERITIS

SOME EXPERIMENTS ON COOKING AND STERILISATION

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THE lay public is only too ready to blame shellfish for gastric upsets. Yet references to gastro-enteritis caused by lobsters are rare. Faidherbe (1904) describes two typical cases, and Stcherbak (1907) describes one case, which was followed by polyneuritis LaFavre (1930) reports an outbreak on the U.S.S. *Patoka*, due apparently to crawfish infected with salmonella organisms I myself have previously described two epidemics, the first of 152 patients, and the second of 49 (Royds Jones 1938). The lobsters responsible in the second outbreak were placed alive in boiling water, cooked for approximately forty minutes as they were "of large size," and served without being placed in cold storage After the claws were cut off, the body was split longitudinally. The gut was then removed by the cook's fingers and the body cut up by him into portions for service.

I suggested that if the lobsters had previously fed in contaminated waters and if the cooking had been insufficient to sterilise the gut completely, any bacteria in the intestine might have been transferred by the cook's fingers to the flesh, and thus to the patients To test this theory, 6 lobsters, from the same consignment and cooked at the same time were dissected and their intestines removed, minced, placed in broth and incubated *B. coli* and *B. proteus* were isolated Prof J. W. H. Eyre repeated the experiment with another 6 of these lobsters, and on investigating each intestine separately, he recovered *B. coli*, *B. proteus*, and *B. lactis aerogenes* from three, while the other three proved sterile

OBJECT OF EXPERIMENTS

The experiments reported here were undertaken firstly to find the time of cooking necessary to sterilise the intestine of the lobster, and to see whether or no this spoiled the lobster for eating, and secondly to ascertain the temperature to which the gut of the lobster is raised by different periods of boiling

There are two methods of cooking lobsters; they may be placed in cold water and brought gradually to the boil as recommended by the Royal Society for the Prevention of Cruelty to Animals (Sinel 1937) and frequently carried out in France, or they may be plunged alive into boiling water. I made inquiries at big fish restaurants in London and at a large wholesale fishmonger's in Billingsgate, and the second method seems to be the one commonly used over here. This was therefore adopted for the experiments. Each lobster was weighed and only those between 1½ and 2 lb. were used for the first series of experiments The thickness of the shell cannot be controlled, since it depends on the time since the last carapace was shed.

STERILISING LOBSTERS

Batches of lobsters were placed alive in boiling water and cooked for varying periods, the time being taken from when the water returned to the boil Each intestine was then dissected out with sterile precautions, minced into a broth tube, incubated and plated out on Conradi-Drigalsky medium. From this, colonies were "fished," grown on agar slopes, and examined for motility, Gram staining, and fermentation of lactose, glucose, saccharose, mannite, and dulcite. A growth of organisms obtained in this way gives no indication of how heavily the gut remained infected, but only shows that at least some micro-organisms in that intestine had survived the cooking During these experiments 65 lobsters' intestines were examined, and the results are shown in table I From all intestines recorded as showing growth in the table, Gram-negative bacilli were isolated, giving colonies on Conradi-Drigalsky medium similar in appearance to the coli-aerogenes group Some gave the reactions of *B. coli communior*, some of *B. coli anaerogenes*, some of *B. lactis aerogenes*, and others gave variations in sugar reactions from the common types belonging to this group.

TABLE I

(A) = Experiment number
(B) = Lobsters (L) used
(C) = Duration of boiling in minutes
(D) = Bacteriological result shown as number of intestines giving growth

(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
1	5	20	4	5*	12 {6 L, 6 L}	35, 75	3, Nil
2	6	25	5				
3	6	35	6	6*	18 {6 L, 6 L, 6 L}	30, 45, 60	Nil, Nil, Nil
4	6	45	Nil				
				7*	12 {6 L, 6 L}	25, 45	3, Nil

* *In these last three experiments all the lobsters in each experiment were put into boiling water together, and batches were taken out at the times shown*

It appears from table I that 45 minutes' boiling usually suffices to sterilise the intestine of a 2 lb. lobster. In my opinion this is not long enough to upset the taste and palatability of the flesh. In restaurants and among wholesale fishmongers, the average time allowed for a 2 lb. lobster appears to be 25 to 30 minutes' boiling. From the bacteriological point of view, this would seem to be insufficient.

HOW HOT DOES A LOBSTER GET?

The temperature in the centre of a joint of meat does not rise to near boiling-point even after prolonged cooking (Thompson 1901). I can find no information about the temperature reached by the flesh of the lobster after different periods of immersion in boiling water. I therefore performed three experiments with 21 lobsters. The procedure adopted was to plunge the lobsters into boiling water simultaneously, and

to take them out one at a time at known intervals, break the head off the body, and thrust two thermometers into the interior of the flesh, taking the lower reading No allowance was made for the cooling of the lobster after removal from the water or for the coolness of the thermometer itself, but it is probable that the heat thus lost was small The findings are shown in table II These experiments show that the

TABLE II

(A) = Experiment number (B) = Lobsters used and weight
(C) = Duration of boiling in minutes
(D) = Temperature in degrees centigrade

(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
1	5 (1 lb 4 oz each)	10	82·0	3	11 (2 lb each)	5	60 0
		15	84 5			10	76 5
		20	86 5			15	76 5
		25	85 5			20	82·0
		30	89 0			25	87 5
2	5 (2 lb each)	25	79 0			30	82·0
		35	91 0			35	90 5
		40	87·5			40	85·0
		47	90 0			45	90 5
		60	91·0			55	95 5
						75	95 5

temperature in the centre of the larger lobsters takes about 45 min to rise to the neighbourhood of boiling-point This probably accounts for the prolonged cooking necessary to sterilise the intestinal canal

SUMMARY

1 Cooked lobsters have sometimes caused gastro enteritis

2 Pathogenic organisms are probably carried from the gut of the lobster to the flesh by the cook during preparation for serving

3 If a 2 lb lobster is cooked in boiling water for 45 minutes instead of the usual 25 or 30 minutes, the gut is satisfactorily sterilised, and the taste is not appreciably affected

4 The internal temperature of a large lobster does not approach boiling point until it has been boiled for 45 minutes

5 If there is doubt about how long lobsters have been cooked, it is safer to eat small 1 lb lobsters, which are presumably more easily sterilised, or to confine oneself to the claws, or to recooked lobsters (for example "Lobster Cardinal")

I wish to thank Dr J E McCartney of the Southern Group Laboratory, London, for providing all the media for these experiments, except those for experiment 5, table I This experiment I carried out by courtesy of Dr Arthur Davies at his laboratory at the Seamen's Hospital, Greenwich, with media provided by him I have to thank Mr W A. Bennett of J Bennett (Billingsgate) Ltd , wholesale fishmongers, for supplying the lobsters used in these experiments

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CLINICAL NOTES

GRANULOPENIA FOLLOWING ADMINISTRATION OF M & B 693

BY G O A BRIGGS, M B Camb , M R C P , D P H
DEPUTY MEDICAL SUPERINTENDENT OF LEICESTER ISOLATION HOSPITAL

Two patients with puerperal pyrexia were recently admitted to the Leicester Isolation Hospital on the same day Both had heavy uterine infections, though no pathogenic organisms were isolated Both were given M & B 693, developed rashes and granulopenia, and recovered

CASE RECORDS

CASE 1.—A multipara, aged 27, with a history of a previous attack of puerperal pyrexia, was admitted on the eighth day of the puerperium. She had been delivered of twins before the midwife's arrival and had had a severe postpartum hæmorrhage She was distinctly anæmic (hæmoglobin 20 per cent) and had a heavy uterine infection, blood-culture being sterile.

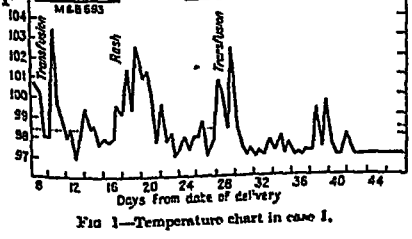

FIG 1.—Temperature chart in case 1.

TABLE I.—CASE 1

Date (1939)	R B C. (millions)	Hb %	W B C	Polymorphs (and per cent)
May 22	3020	29	67 300	54 513 (81)
„ 23*				
„ 31	3340	37	15 700	11,461 (73)
June 7†	3730	42	3600	396 (11)
„ 9			4800	240 (5)
„ 10*				
„ 12	3980	46	4400	156 (4)
„ 14			4800	528 (11)
„ 16			7900	2686 (34)
„ 21	3960	55	9500	6745 (71)
„ 27	4010	62	12,300	8610 (70)

* Transfusion † Pentnucleotide started

M & B 693 was given by mouth in daily doses of 9 g at first and 6 g later, and the anæmia was treated with iron and a blood-transfusion of 500 c cm The temperature fell to normal in a week but rose two days later coincident with the appearance of a scarlatiniform rash (fig 1) Since this appeared to be a drug rash and the white-cell count had dropped from 67,300 to 15,700, the administration of M & B 693 was stopped 60 g having been given in nine days

A week later, although the temperature had become normal and the patient looked and felt well and the hæmoglobin percentage continued to rise, the white-cell count had fallen to 3600 of which 396 (11 per cent) only were polymorphs Intramuscular injections of 20 c.cm of Pentnucleotide were then given daily and a transfusion of 500 c cm of blood, but the polymorph count fell further to 156 (4 per cent of total white-cell count), though the hæmoglobin percentage continued to rise The first rise in the number of polymorphs was not registered till seven

days after starting the administration of pentnucleotide and four days after the transfusion Progress after this was rapid and uneventful (table I).

CASE 2.—A multipara, aged 41, was admitted on the eighth day of the puerperium after a normal labour. There was a heavy local infection of the uterus, blood-culture was sterile, and the general condition was good. M & B. 693 was given in daily doses of 6 g at first and 3 g later. After 42 g. had been given

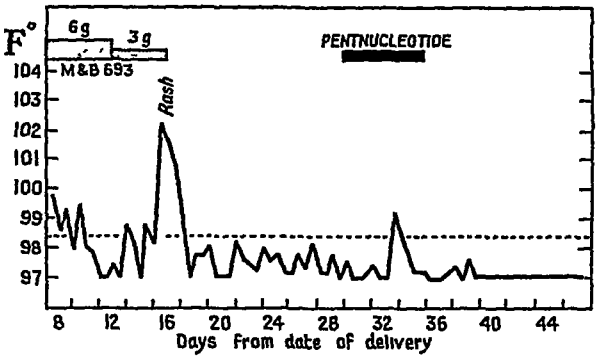

FIG. 2—Temperature chart in case 2.

in nine days, administration of the drug was stopped owing to the appearance of a morbilliform rash, obviously a drug rash (fig. 2).

The white-cell count, which had been initially 8500, was found ten days later to have dropped to 5800, of which only 1392 (24 per cent) were polymorphs. Two days later a course of intramuscular injections of 20 c.cm. of pentnucleotide was started and continued for five days, but a white-cell count made the same day as the administration of pentnucleotide was started showed the polymorphs to have already risen to 2709 (43 per cent of a white-cell count of 6300) Further recovery was uneventful (see table II).

TABLE II—CASE 2

Date (1939)	R B C (millions)	Hb %	W B C	Polymorphs (and per cent)
May 22	5050	78	8500	6120 (72)
June 10	.		5800	1392 (24)
„ 12*	..	..	6300	2709 (43)
„ 14	..	..	7200	4176 (58)
„ 22	4760	70	6700	4355 (65)
„ 27	4810	75	10,400	5096 (49)

* Pentnucleotide started

COMMENT AND CONCLUSIONS

The occurrence of a rash on the eighth day of administration of M. & B. 693 agrees with Thompson's (1939) findings as to time of onset of rash The discontinuance of administration of M. & B. 693 did not prevent the development of granulopenia a week later in both cases, as has also been found by Sutherland (1939)

Pentnucleotide had no observable influence on the course of the granulopenia, the polymorph count in case 1 showing no improvement till seven days after the start of its administration, whereas in case 2 the count was already rising when treatment was begun. In this our findings do not agree with Crofton (1939)

Blood-transfusion was only given in case 1, and the polymorph count did not improve till four days had elapsed Nevertheless transfusion may be a useful means of tiding the patient over a period of danger.

The difference in the severity of granulopenia in the two cases may be partly accounted for by case 1 having received 60 g of M. & B. 693 in nine days, whereas case 2 only received 42 g. in the same time If so, this agrees with Sutherland's (1939) suggestion that quantities over 50 g. may be dangerous to patients already suffering from a disease which causes some destruction of blood corpuscles

Granulopenia is a definite and dangerous complication associated with the administration of M & B. 693 The drug should not be given in massive doses without adequate control by examinations of the blood. The appearance of a rash is an additional indication for further investigation of the blood

My thanks are due to Dr. J. C H. Mackenzie, medical superintendent, for permission to publish these cases and for helpful criticism, and to Dr. E M. Ward for pathological investigations.

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PRIMARY FIBROSARCOMA OF THE HEART

REPORT OF A CASE

BY MARGARET NELSON JACKSON, B M Oxfd, D.P M

ASSISTANT MEDICAL OFFICER AT THE FOUNTAIN HOSPITAL, LONDON, AND

J N JACOBSON, M R.C.S, D P.M., D M R E

DEPUTY MEDICAL SUPERINTENDENT OF THE HOSPITAL

PRIMARY tumours of the heart are rare and generally cause no symptoms, only one such tumour has been diagnosed during life. About 80 per cent of the tumours reported have been benign. Of 143 cases collected by Mandelstamm (1923) 117 were benign and 26 were malignant Most of the benign tumours were myxomata and most of the malignant tumours sarcomata Fibrosarcomata are less common than many other varieties of sarcoma; of the 230 primary heart tumours reported by Lymburner (1934) 57 were sarcomata and none fibrosarcoma Yates (1931), analysing 45 reported cases of sarcomata, found that only 3 were fibrosarcomata; round-celled and spindle-celled tumours made up three-quarters of his series

Primary sarcomata of the heart are not usually associated with developmental defects as are the rhabdomyomata, but Fidler, Kissane, and Koons (1937) reported a case of cardiac fibrosarcoma in a boy, aged 9 months, who also had hare-lip, cleft palate, and double inguinal hernia. Four other such tumours have been reported by Popp (1932), Raw (1898),

FIG. 1—Macroscopic appearance of fibrosarcoma on section of the heart.

Jürgens (1891), and Ericsson (1908) in patients whose ages ranged from 33 to 43 years None of these patients showed developmental defects, and the tumour was discovered at autopsy in each case

In our case there were mental defect and developmental anomalies besides the tumour of the heart

FIG 2—Microscopic section (low power) of fibrosarcoma of heart, showing dense interlacing fibrous tissue

The patient was a microcephalic girl of idiot grade, aged 9 years She was diplegic, with adductor spasm of the legs, spastic arms, and postural scoliosis Her face was asymmetrical, the right side being larger than the left She had internal strabismus and bilateral optic atrophy There was no clinical evidence of abnormality of the heart She died in November, 1937, of pneumonia and pneumococcal meningitis

Necropsy.—Her brain (weighing 23½ oz.) was the typically small brain of the microcephalic Purulent exudate containing pneumococci covered the outer and inferior surfaces of the frontal lobes On section of the brain the corpus callosum was found to be absent The right lung showed advanced bronchopneumonia of the lower lobe The kidneys were slightly lobulated

There were no other abnormal features except in the heart The pericardium contained a slight excess of clear straw coloured fluid The heart weighed 4½ oz and the left ventricle appeared to be enlarged On section a white rounded tumour, measuring about 1 × 1½ in., was found in the left ventricular wall, near the apex of the heart (fig 1) The tumour, thinly covered by myocardium, bulged into the left ventricle and occupied about half of the cavity It pressed against the interventricular septum, deflecting it and causing it to bulge into the right ventricle The tumour occupied only the apical tissue of the left ventricular wall, which covered it like a thin shell At the apex of the heart the muscle covering the tumour was about ⅛ in thick and was pale

Under the low power of the microscope sections of the tumour showed dense fibrous tissue arranged in long interlacing strands (fig 2) At the border irregular finger-like processes of fibrous tissue extended from the tumour into the heart muscle, especially in the neighbourhood of blood vessels Under a higher power the tumour cells appeared fibroblastic in type, with plump elongated nuclei At the borders of the tumour fibroblastic cells could be seen interpenetrating the heart muscle fibres, replacing them, and forming cuffs about the blood vessels In the peripheries of the tumour were many cells with irregular nuclei, fibrosarcomatous in type

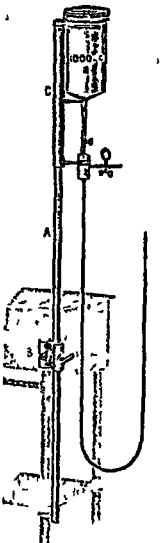
We wish to thank Dr J I S Lloyd, medical superintendent of the Fountain Hospital, for his kind permission to publish this case

Continued at foot of next column

New Inventions

STAND FOR INTRAVENOUS THERAPY

THE majority of "intravenous" stands for suspending the container when giving a blood transfusion or intravenous saline consist of some form of tripod with a hook-like upper extremity from which the container is slung by a metal ring and bucket handle This is a very unstable piece of apparatus, for the tripod may be knocked out of position by anyone passing the foot of the bed and the container swings precariously in the air This pattern of stand also is difficult to transport from operating theatre to ward



The stand shown in the figure consists of (A) a hollow steel rod 4 ft long and slotted at its upper end, (B) a universal clamp by which the rod may be attached to a bed, side table, or theatre trolley, and (C) a frame for holding the container The frame is a hollow cylinder carrying two or three incomplete metal rings, with a transverse bar at its upper end which fits into the slot on the top of the steel upright A spring clip, like a trouser clip, may be used instead of the upper metal ring on the frame This prevents any rattling and also allows for small variations in the size of the necks of the containers In my experience it does not stretch or lose its spring In the pattern in use at St George's Hospital, London, there is an additional spring clip attached to the lower extremity of the frame This is to hold the visible feed (glass dropper with side arm)

The height of the container can be varied by adjusting the rod in the clamp The glass container advised is of two pints capacity; the more usual four-pint size is larger than necessary for the average transfusion and clumsy to manipulate The Ministry of Health bottles provided in the emergency transfusion sets which have recently been distributed to civilian hospitals can readily be slung by their wire handle from the upper end of the slotted rod If the rotary pump is being used the platform on which this is mounted carries a small fitting which enables the transfusion unit to be carried by the steel upright

This type of stand is light, it is interchangeable between operating table theatre trolley and patient's bed, and it is stable It is an advance on any other type I have seen or used

The makers are the Genito Urinary Mfg Co Devonshire Street, London

VICTOR RIDDELL, M.D. Camb., F.R.C.S.

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MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SECTION OF MEDICINE

AT a meeting of this section, with Dr. A. GREIG ANDERSON (Aberdeen), the president, in the chair, a discussion on the

Medical Treatment of Peptic Ulcer

was opened by PROF. EINAR MEULENGRACHT (Copenhagen). He began with the treatment of bleeding ulcer, because the experience obtained with a free diet has influenced his outlook on the treatment of ulcer in general. From 1931 onwards he has treated all his cases of hæmatemesis and melæna from the first day "with food" The diet has been varied and liberal consisting of soft and non-irritating foods —the so-called purée diet—and fluids have been allowed as desired. Up to the beginning of this year 491 cases of profusely bleeding ulcer have been treated in this way. Cases of hæmorrhage from cancer of the digestive canal and from cirrhosis of the liver were not included He has found that (1) patients, doctors and nurses like the treatment; (2) the food in the stomach does not increase or protract the bleeding; (3) post-hæmorrhagic shock is diminished or not noticed at all, (4) strength is regained more quickly; (5) blood regeneration is more rapid; (6) convalescence is shortened; and (7) the mortality in this series was between 1 and 2 per cent Nausea should not be a contra-indication to this form of treatment, since the food usually relieves nausea by causing the stomach to empty itself of blood. The treatment is unlikely to be successful if it is applied hesitantly; indeed, the more severe the hæmorrhage the more urgent is the patient's need for fluid and food. Professor Meulengracht does not advise operation to check bleeding, but blood-transfusions are indicated in dangerously ill patients. He admitted that it is difficult to compare his results with those obtained in England with the usual strict regime, but he said that a mortality of 7–9 per cent is still usual in Denmark when the older type of treatment is used

Lean, over-active men who do not give enough time to meals are especially prone to the development of peptic ulcer and the nervous element is important as an ætiological factor The fundamental principles of treatment are, therefore, rest, relaxation and a calmer outlook on life As a result of experience with bleeding ulcers, Professor Meulengracht has adopted a freer dietary regime in cases without hæmorrhage—i.e., soft non-irritating food taken liberally and often. The diet must be sufficient not only in quantity but also in quality, and must contain the necessary amounts of vitamins and salts. He considers that the use of alkalis and belladonna is advisable but not of paramount importance

Dr. T. L. HARDY (Birmingham) agreed with the plea for a more liberal diet in uncomplicated cases, but he himself has not extended this as far as Professor Meulengracht. Most patients admitted to hospital are, he said, in a state of mild under-nutrition and vitamin-C deficiency is common. Convalescence is considerably shorter when a generous diet is given than when the patient is restricted to small quantities of milk and cereals over a long period. Patients should be made thoroughly conversant with the details of treatment while in hospital, because a life-long policy rather than a short-term one is essential if recurrences are to be avoided Those liable to the disease are restless, energetic and hard-working people. Complete rest in bed for at least a month is therefore indicated, ambulatory treatment being unsuccessful in the great majority of cases. It is the duty of the doctor to inquire fully into the daily routine of each patient and to suggest modifications which will relieve mental and physical strain Peptic ulceration is often activated during times of overwork and this fact increases the difficulty of instituting proper treatment by rest in bed. In Dr Hardy's view small doses of sedative drugs such as phenobarbitone are of more value in treatment than alkalis. Tobacco and alcohol should be forbidden during the strict stage of treatment but may be allowed in small quantities later as a concession to human frailty.

Dr. ARTHUR LEESE (Oxford) described the results of balance experiments on patients with gastro-intestinal hæmorrhage. The rise in blood-urea which follows hæmorrhage may be due to three factors—(1) a breaking down of body proteins; (2) absorption of nitrogen from the bowel, and (3) a temporary renal impairment. In view of the first of these factors a liberal diet containing adequate protein is an important part of treatment.

Dr. T N. MORGAN (Aberdeen) dealt with the metabolic changes after severe hæmorrhage from peptic ulceration. Renal function is reduced as a result of diminished blood-volume and low blood-pressure The urea in the blood, derived from the nitrogen absorbed from the bowel and from the utilisation of body protein, therefore rises to high levels. The high blood content of urea then acts as a diuretic and tends to decrease still further the body fluids These considerations support Professor Meulengracht's plea for a liberal diet and unrestricted fluid intake in cases of hæmorrhage

Dr. B M NICOL (Aberdeen) discussed the effects of different diets and drugs on the mean free gastric acidity. In patients with peptic ulcer samples of the gastric contents were aspirated at intervals over periods of twenty-four hours Three types of diet were used: (1) small milk feeds hourly; (2) a similar diet given at two-hourly intervals; and (3) a light ward diet The mean free gastric acidities were 61, 39 and 47 units respectively Gastric acidity can be controlled if milk is dripped continuously into the stomach at the rate of 5 oz. each hour. This indicates that the failure of an hourly feed of 5 oz. of milk to control the acidity is due to the fact that the milk is rapidly expelled from the stomach. Atropine gr. $\frac{1}{60}$ four-hourly, given in addition to feeds every two hours, make little difference to the acidity, and Dr. Nicol obtained similar results when large doses of magnesium trisilicate and aluminium hydroxide were given. He concluded that two-hourly feeds of high protein value probably constituted the best form of diet therapy. Atropine should be used only if symptoms suggesting pyloric spasm are present, and in such cases the dosage should be pushed to the limit of tolerance The importance of high gastric acidity in preventing healing may be exaggerated, since healing apparently takes place satisfactorily in spite of a high mean acidity provided that the patient is kept at rest in bed.

Dr S W. PATTERSON (Ruthin Castle) outlined the routine treatment given at Ruthin Castle Rest in bed for at least a month, proper cleansing of the mouth and attention to the teeth, the avoidance of tobacco, and the administration of alkalis are factors

of importance in promoting healing The diet in the early stages consists of 4–10 oz of milk with or without egg, given every three hours and sipped slowly throughout this period A rise in gastric acidity and stretching of the ulcer are avoided by this method of treatment

Dr J JACQUES SPIRA (London) said that it is essential to differentiate clearly between acute and chronic peptic ulcers Acute ulcers are often multiple, are either fatal or heal rapidly, and probably have a systemic origin Chronic ulcers, on the other hand, are always single and produced by a local inflammatory process An acute ulcer never becomes chronic and a chronic ulcer never becomes acute Dr Spira then outlined his theory of the ætiology of chronic ulceration Gastric peristalsis is normally uni directional, and therefore the function of the pylorus is to prevent the regurgitation of duodenal contents into the stomach The presence of fat in the stomach brings about regurgitation, and the association of bile and hydrochloric acid then produces gastritis with hypertonus and hypersecretion The logical treatment is to give alkalis to control the acidity and to prescribe a fat free diet—1 c, one containing no visible fat and without milk and eggs

Dr A T M WILSON (London) said that patients who develop peptic ulceration react with a bodily and mental disturbance of a particular pattern leading to gastric dysfunction when driven or led into situations capable of producing emotional states Such patients should therefore understand thoroughly the connexion between emotional and gastric upsets Some of them tend to resist the idea and some form of psychological treatment is then both necessary and effective

Dr LAURENCE SCOTT (Glasgow) said that there is marked and immediate benefit when cases of hæmatemesis are treated on the lines laid down by Professor Meulengracht, but one cannot expect much benefit from the administration of a purée diet alone when the lesion is very severe—e g causing erosion of the pancreas

Prof L S P DAVIDSON (Edinburgh) said that the treatment of bleeding ulcer has now been placed on a satisfactory basis since any well balanced non irritating diet given two hourly together with mental and physical rest, produces healing in the great majority of cases Operation to control hæmorrhage should not be resorted to until not less than three or four blood-transfusions have failed If this rule is adhered to the indications for operation are very rare Professor Davidson suggested that ambulatory treatment may be preferable to complete rest for those patients with non bleeding ulcer who worry greatly if they cannot give at least some attention to their business

Prof R S AITKEN (Aberdeen) said that it is wrong for ambulatory patients to take atropine for the sole purpose of relieving pain Pain should be a warning that the patient is driving himself too hard, and its proper treatment is more rest

Mr HAROLD DODD (London) referred to the rôle of surgery in the treatment of peptic ulcer Some patients lead miserable lives because of recurrent attacks of pain which are not relieved by strict attention to the usual regime In such cases operation is often successful and enables the patient to adopt a higher scale of living He believes also that removal of septic foci gives complete relief in a fair proportion of cases

Dr A GILLIS ANDERSON (Aberdeen) discussed the relationship between the site of a gastric ulcer and the type of treatment which should be adopted The chances of malignancy in ulcers on the greater curvature are so great that all such cases should be explored surgically as soon as possible There is also a definite tendency to malignant changes in ulcers of the pyloric antrum, and in these medical treatment should therefore not be continued for more than three or four weeks unless there is conclusive evidence of healing Ulcers of the pars media in the region of the lesser curvature rarely become malignant and should be treated medically under radiological control.

SECTION OF ORTHOPÆDICS

AT a meeting of this section with Mr ALEXANDER MITCHELL (Aberdeen) in the chair, a discussion was held on

The Painful Shoulder

Dr PHILIP DUNCAN WILSON (New York) spoke of 168 cases of shoulder pain personally studied He suggested that as lesions round the shoulder-joint had a varied and vague pathology any classification must be on an anatomical basis In his series lesions of the subacromial bursa made up 53 per cent The bursa was particularly important in especially abduction and rotation He agreed with Codman that often disease in the underlying avascular supraspinatus tendon was the cause of symptoms which were more evident in the more vascular subacromial bursa Calcifying tendinitis was quite often a cause of pain The deposit of calcium was visible on X ray in the supraspinatus tendon, but sometimes as much or more was seen in the contra lateral and symptomless shoulder In some cases the deposit continued into the insertion in the greater tuberosity of the humerus The material seen at operation varied in consistency from gritty particles to something like white toothpaste, and might even be mistaken for pus Similar deposits have been described in gluteus medius, flexor carpi radialis and the tendo achillis Microscopically, the deposit was first seen in small circumscribed areas in the tendon fibres These enlarged and worked their way to the surface of the tendons, and later on all the changes of acute inflammation might be found The origin was obscure but was possibly due to the deposit of calcium salts in already degenerating cells When the affected tissue was still deep to the tendinous structures there was no pain until the mass bulged outwards sufficiently to impinge on the acromion process on abduction This was the subacute phase and an X ray taken then would show the early lesion The acute phase was characterised by sudden very severe pain in the shoulder with redness and tenderness below the acromion process In some cases, the mass had ruptured into the subacromial bursa which contained calcified material and fibrin Treatment with rest and physical therapy was sometimes followed by relief and X-ray improvement, but surgical excision always gave a good result But in the subacute stage patients were unwilling to have an operation, and fortunately aspiration and irrigation through wide bore needles was very satisfactory Occasionally the deposit was too solid for aspiration and operation was then the method of choice

Periarticular adhesions were another common cause of shoulder pain They occurred in rather older people and were commoner in males There was no clear cut pathology but symptoms were more definite These were limited and painful abduction and rotation of the arm, often accompanied by night

pain. X ray did not reveal any abnormality other than occasional flecks of calcification in the joint-capsule The treatment was manipulation, usually under an anæsthetic Foci of infection could not be blamed for the condition, nor was the disease self-limiting. Physical therapy, pendulum exercises, manipulation, and arm-suspension did a great deal to shorten the disease Adhesive traction applied to the suspended arm, with the elbow flexed to a right angle, was of particular value in undoing the painful muscular spasm which frequently followed vigorous manipulation

Mr. V. H. ELLIS (London) agreed about the difficulty of classification, and confined his attention to lesions of the supraspinatus tendon. These may be contusion, partial or complete rupture and degeneration Trauma was commonest in manual labourers and was usually a fall on the abducted arm. On examination, passive movement of the shoulder was full, but pain was felt when the supraspinatus insertion was passing under the acromion process Active abduction was limited beyond 20 or 30 degrees Pain was felt over the greater tuberosity, and at the insertion of the deltoid. This pain was much more severe than that felt in dislocations or fractures of the greater tuberosity. With complete tears, the symptoms were similar for a few days, but after that time movement of the humeral head did not return on electrical stimulation of the supraspinatus muscle as it did with partial tears Later on there might be wasting in the supraspinous fossa In most cases not treated by operation healing was the exception, especially where there was a degenerative element present The best operative exposure was through the anterior fibres of the deltoid There was no difficulty in exposing complete tears, but partial tears were less easy to identify. The period of convalescence was, about three months if passive movements were started early

Mr. B. L MCFARLAND (Liverpool) stressed the usefulness of the aspiration of calcifying tendinitis, and of pendulum exercises as an after-treatment of shoulder lesions He adopted a practical clinical classification :—

(1) Cases where there is no limitation of movement —i e , where the lesion is outside the joint. (*a*) where movement does not affect pain ; (*b*) where movement does affect pain

(2) Cases where there is limitation of movement : (*a*) limitation similar in all directions ; (*b*) limitation mostly in one direction.

Where there was no limitation of movement, and movement did not affect pain, the pain was referred from some outside source—e g., the heart or the cervical spine. Where movement did affect the pain, there were usually some changes overlying the joint—e g , fibrositis or tenosynovitis. Where movement was limited in all directions equally, the cause was probably some form of arthritis Lastly where movement was limited in one direction only, there were only three likely causes : lesions of the supraspinatus tendon, adhesions, and calcifying bursitis. Calcifying bursitis and supraspinatus injuries were closely allied. It was possible that there was a condition in the long tendon of biceps allied to trigger-finger, which might give rise to similar symptoms Adhesions in the shoulder-joint were very common, and were caused by trauma, exposure, strained posture or bad position during breast and other operations. In manipulation two kinds of adhesions were obvious to the trained ear, those which tore and those which snapped. Those which snapped were the single massive adhesions which limited movement in one direction, and they had a better prospect of recovery than cases with multiple smaller adhesions

Mr. H O. CLARKE (Manchester) praised the two-needle technique of aspirating calcifying tendinitis He mentioned the occurrence of shoulder stiffness in patients recovering from acute febrile illnesses, and stressed the value of manipulations repeated at weekly intervals and with increasing ranges of movement at each manipulation. He personally had difficulty in identifying tears in the supraspinatus tendon at operation

Dr. BREBNER SCOTT (London) said that he had had a painful shoulder for some time and agreed that the suspended position gave some relief. Otherwise he thought that time had been the most important factor in his recovery. Dr. GERALD SLOT (London) thought that pain ought to be treated as a disease rather than as a symptom, and recommended massive and repeated injections of novocain into muscles in spasm round a painful joint He liked pentothal anæsthesia for manipulations and thought that gold injections were valuable in some cases / Mr H J MCCURRICH (Hove) also had a painful shoulder which he ascribed to continual driving of his car in all weathers He wondered if pain in the left shoulder was commoner in America, where drivers exposed the left side.

Mr D. MCVICKER (Belfast) said he could often elicit a history of pain before the alleged injury, and laid stress on diet as a possible line of treatment He did not favour anæsthesia for manipulations, preferring repeated movements to the limit of tolerance. Mr H. POSTON (Manchester) did not think focal sepsis was important He believed snapping adhesions were intra-articular and the tearing type were extra-articular. Working in an area where calcium deficiency was common, he did not often see cases of supraspinatus calcification. Miss M. F. FORRESTER-BROWN (Bath) pressed the claims of spa treatment combined with other measures

Mr. V H. ELLIS admitted the difficulty of identifying the tear in the supraspinatus tendon at operation and agreed that it was very much easier if treatment were started early. Mr. B. L MCFARLAND had seen several cases where shoulder stiffness had occurred after acute illnesses. Repeated small manipulations were useful, especially where there were multiple adhesions, but he always preferred to have the patient under an anæsthetic.

"A hospital is intended primarily and ultimately for the medical treatment of the sick, all its other services are subsidiary to this, its main, purpose. Only a medical man who has spent at least six years in acquiring his knowledge can guide a hospital efficiently, for he alone can have knowledge of the medical side of the work for which the hospital was established. Only a medical man can by his training realize the relative value of the medical needs of an institution Only a medical man can discuss on terms of equal understanding with his seniors and fellows, the members of the honorary staff, necessary progress and expansion. Only a medical man can supervise the work of the medical staff Since the treatment of the sick is all important in the life of a hospital, and since none but a person trained in medicine can understand this treatment, it follows that the control of a hospital should not be entrusted to a layman who has not sufficient knowledge to give judgement on a medical problem, and who is apt to allow the side that he knows, the business side, to override the side that he does not know. Control of a hospital entrusted to a layman is like the navigation of a ship given into the hands of its purser."
—R B. WADE, *Aust N.Z. J. Surg.* April, 1939, p 413

REVIEWS AND NOTICES OF BOOKS

Sexual Disorders in the Male

By KENNETH WALKER, F R C S, surgeon to the genito-urinary department, Royal Northern Hospital, and to St Paul's Hospital, London, and ERIC B STRAUSS, D M Oxfd F R C P, physician for psychological medicine to St Bartholomew's Hospital, and physician to the Tavistock Clinic, London London Hamish Hamilton Medical Books 1939 Pp 248 10s 6d

THIS short volume, which has been completely revised and supplemented by an account of the psychological aspect of sexual disorders, is intended for the general practitioner and senior medical student, and as such will be welcomed For sexual education is so neglected that even many doctors and students are vague as to the normal functions of sex, to say nothing of its disorders The book ably points out the psychological conditions, conflicts and the like which arise through ignorance of the primary facts of life and may lead to impotence, ejaculatio præcox, sexual deviations and a variety of other disorders The authors outline their causation and treatment, but surely the real solution of these difficulties lies in prevention through the sensible instruction of every one before marriage Wedlock is an art which, like any other, must be based on knowledge, whereas any couple can now try to set in motion a highly sensitive chain of nervous reflexes without any instruction whatsoever

Impotence necessarily takes up much of the book Masturbation is dealt with sensibly, its part in the normal development of sex and its usual harmlessness are explained The authors plead for an alteration of the law which still regards homosexuality as a crime, and their arguments might well be read by members of the bench Their remarks on the endocrine treatment of the enlarged prostate are wisely restrained, but too little is said of therapy with testosterone propionate for various other disorders of the male Many failures with this drug must be due as Mr Kenneth Walker says, to insufficient dosage

The book will help the practitioner to rectify some of the damage resulting from ignorance in those less reticent patients who seek his advice

Short Textbook of Surgery

(2nd ed) By C F W ILLIS WORTH, M D Edin, F R C S E, lecturer in clinical surgery, University of Edinburgh, assistant surgeon, Edinburgh Western Hospital London J and A Churchill 1939 Pp 707 21s

THAT a second edition of this excellent textbook has been called for within a year is a striking tribute to its popularity amongst students This is understandable, for the subject has been skilfully condensed without the necessity for many omissions In this edition new matter has been added on the treatment of jaundiced patients, sympathectomy and the use of sulphanilamide It does not seem quite a fair presentation of the facts to say that 'sulphanilamide appears to be of some value" in *B coli* cystitis, nor does it seem advisable to state that presacral nerve section is employed for dysmenorrhœa without giving some indication of its serious drawbacks for this purpose But when all is said and done there remains very little for criticism There may be a few slips here and there as for example the erroneous statement that abscesses are situated at the root of the lung, when the author means near the mediastinal part of its periphery, but they are very few Particular praise may be accorded to the accounts of general subjects such as physiotherapy, postoperative complications, salt and water balance, renal function tests, diabetic surgery, all these are treated simply, clearly and sufficiently to give the undergraduate an intelligent grasp of them There are about 30 new illustrations The book has an established place which we predict will be maintained

Le Gastriti Croniche

By PAOLO ALESSANDRINI, senior physician to the United Hospitals of Rome 1939 Pp 275 Lire 15

Le Cefalee

By GIOACCHINO FUMAROLA, professor of neuropathology in the University of Rome 1939 Pp 101 Lire 15

Parassitosi Intestinali

By VITTORIO VANNI, director of the institute of medical parasitology of the University of Rome 1939 Pp 101 Lire 15

Diabete e Glicosurie non Diabetiche

By GIULIO C DOGLIOTTI, assistant to the institute of medical pathology and clinical methodology of the University of Florence 1939 Pp 212 Lire 15

THESE four monographs, published by A Valleccbi of Florence, form part of a series dealing with practical aspects of medical subjects, edited by Professor Frugoni of the University of Rome Without going deeply into their subjects they are designed to supply the general practitioner with a means of rapidly refreshing his memory and bringing his knowledge up to date Of these volumes Professor Dogliotti's (on diabetic and non diabetic glycosuria) is outstanding for the amount of information it contains and for the lucid way in which this information is presented Vanni's monograph on intestinal parasites summarises the essential points clearly, and is well illustrated Both these books include a small bibliography Headache, dealt with by Fumarola, is too large a subject to be satisfactorily compressed within the limits of this series, and the section on treatment is sketchy The monograph on chronic gastritis gives a brief description of recent advances in gastric pathology and the lines of treatment thereby opened up The series is pleasantly got up, of a handy size and easy to read The absence of an index, which is not unusual in foreign publications, is a source of annoyance to English readers

Pharmacology and Therapeutics of the Materia Medica

(15th ed) By WALTER J DILLING, M B Aberd, M P S (Hon), professor of pharmacology and general therapeutics, Liverpool University London Cassell and Company 1939 Pp 600 10s 6d

THE first edition of this book made its appearance in 1884 with Dr Mitchell Bruce as the author It achieved at once a wide popularity, reprints and fresh editions were published almost annually, and later the original author was joined by Professor Dilling Since then Bruce and Dilling's "Materia Medica and Therapeutics" has become known to students as an amazing collection of information upon the actions, methods of administration and therapeutic uses of drugs It now appears under a slightly changed title and with an improved format The book has been thoroughly revised, every modern remedy and method of treatment of proved value or of promise is included and adequately discussed The section on general pharma-

cology and therapeutics has been printed in larger type—a welcome improvement The book will continue to appeal to students and practitioners who wish to possess a full yet concise account of the modern therapeutical armamentarium.

Clinical Gastroenterology

By HORACE WENDELL SOPER, M.D, F.A.C.P, St. Louis, Missouri. London: Henry Kimpton. 1939. Pp. 314. 25s.

THIS is a book of moderate size and elegant appearance; not a systematic treatise on its subject, but, in the author's words, "a crystallisation of my clinical practice" He takes the ordinary textbook for granted, and in 30-odd chapters on as many gastro-intestinal topics sets forth his own interpretations of *his reading and experience* With much of what he says the orthodox physician would agree, and his style is forceful, suggesting a vigorous and confident personality. Sometimes he is more crisp than logical, as in this conclusion · "indicanuria (and such symptoms as may be attributable to it) is amenable to general dietetic and hygienic treatment, but the reaction in the urine remains four-plus regardless of improvement in the patient's condition" Sometimes he accepts whole-heartedly views which elsewhere have met with much criticism, such as the causation of ulcerative colitis by Bargen's bacillus and the efficacy of its treatment with his serum and vaccine. Elsewhere he attacks widely accepted views with surprising vehemence, especially where he condemns out of hand the drinking of raw milk because it may contain brucella, *Streptococcus viridans*, and streptococci producing peptic ulcer; pasteurisation doesn't sterilise, and is "but a gesture in the right direction", evaporated milk is the only form of milk that should ever be given to children or adults, sick or well. But such idiosyncrasies are mixed with a lot of sound clinical teaching, tersely put, and illustrated with nearly 200 beautiful radiograms.

Everyday Biology

An Introduction to the Study of Life. By G. PUGH SMITH, Ph.D., assistant lecturer in education, University College, Cardiff. London: G. Bell and Sons. 1939. Pp. 283 3s. 6d.

RARELY do writers of school biology books attempt to break away from two well-worn paths One is bounded by the examination syllabus and is concerned with the anatomy of types and a little plant physiology. The other is a disconnected series of little talks on the curiosities of nature To give a sound introduction to modern biology and its relation to human affairs which will appeal to children is no easy task. Dr. Smith has certainly achieved something, mainly because he has devised suitable practical work Excellent suggestions are made for simple experiments and observations on foodstuffs, development, growth, environment, and animal behaviour, apart from the usual dissections and experiments on plant physiology. Another serious difficulty, which the author has not so successfully surmounted, is that of presenting up-to-date conceptions in a small space without making unintelligible or unjustifiable statements. In his short introduction to experimental embryology the author refers to the chemical work on the "organiser," the significance of which is as yet debatable An extraordinary omission is the absence of any discussion on the significance of fertilisation and sex in the light of the facts given. The facts themselves are few; no mention is made of parthenogenesis, though a whole chapter is devoted to the principles of genetics The general tone is a little patronising "This chapter is not big enough nor are you old enough yet for me to tell you more about memory . . .," does not indicate a profound understanding of child psychology. In spite of its deficiencies the book contains much material not easily found elsewhere.

Diverticula and Diverticulitis of the Intestine

By HAROLD C. EDWARDS, M.S. Lond., F.R.C.S, *surgeon and lecturer in surgery to King's College Hospital, London.* Bristol. John Wright and Sons. 1939. Pp. 335. 25s.

THIS monograph is based on the Jacksonian Prize essay for the year 1932, and it has been revised and brought up to date Mr Gordon-Taylor in a foreword praises the author both for the thoroughness with which he has handled his subject and for having allowed seven years to elapse between writing the essay and publishing it in book form. It is this interval no doubt which accounts for the clinical insight and balanced judgment which are outstanding features of the work. The whole subject of intestinal diverticula both congenital and acquired is dealt with, and there is a wealth of illustrative pictures and case-histories The author merits thanks for having brought within one cover so much valuable information on a subject of interest to many branches of the medical profession

Evans' Recent Advances in Physiology

(6th ed.). Revised by W. H. NEWTON, M.D., M.Sc. Manc., reader in physiology in the University of London, at University College. London: J. and A. Churchill. 1939. Pp. 490. 15s.

THE sixth edition of this familiar book is Dr. Newton's second revision of it, and in his hands it still keeps its interesting and progressive character. There are three new chapters, on the physiology of bone, the Carrel-Lindbergh perfusion apparatus, and carbohydrate metabolism. The rest of the book is similar to the fifth edition, but has been fully revised. The chapter on the secretion of urine has been rearranged, and the section on defæcation has been omitted

The chapter on bone deals with its developmental architecture and describes the results of tissue-culture. The chemistry of the inorganic matrix is a little difficult for those who are not familiar with geological classification and X-ray spectrophotography. Blood-calcium and the problem of calcification are discussed, but the influence of vitamin D and the parathyroid are unfortunately omitted The account of the Carrel-Lindbergh perfusion apparatus is of doubtful value It is a new technique results of which are as yet not numerous Any student, who is sufficiently interested in the working details of the apparatus, would consult the authors' original papers and not the condensed account in this book.

Carbohydrate metabolism is becoming exceedingly complex and the chapter dealing with this is very welcome It begins with a reasoned consideration of the significance of the blood-sugar level, but the part dealing with the interplay of endocrine organs is too condensed to be clear. The style of this book is very pleasant. Although full references to modern work are included, the text is much more than a résumé of recent advances in knowledge The author outlines each problem and then leads his reader in orderly progress through the recent investigations This makes the great mass of information much more digestible It also gives a reasonable picture of the present position and some indication of the needs of the future

THE LANCET

LONDON SATURDAY SEPTEMBER 30, 1939

THE ULCER PATIENT

Two things were noteworthy in that meeting of the section of medicine of the British Medical Association at Aberdeen which discussed peptic ulcer, and which we report this week One was the personal impression made on the audience by Professor MEULENGRACHT He told his story crisply and simply, with no beating about the bush His attitude was a compound of keenness and sanity, set off by a faint touch of youthful bravado And his story was worth telling, familiar though it already is to many readers of the English medical journals His main point was that any patient who has bled rapidly from a peptic ulcer is almost certain to recover if he is given reasonable amounts of food and drink at once and frequently (an occasional case may need a blood transfusion), whereas if food and drink are withheld, whatever else is done, he runs an appreciable risk of dying It does not seem to matter much what food and drink is given, so long as it is easily assimilable and contains water, salts, vitamins and calories No special "Meulengracht diet" or "Watts diet" is called for, but simply food and drink, in bland form, as much as the patient will take The principle is plain and it is gaining rapid acceptance from those who apply it In their review in this issue of 241 consecutive cases of bleeding peptic ulcer treated in the Western Infirmary, Glasgow, GRAHAM, ALEXANDER and KERR record a striking fall in mortality accompanying the abolition of starvation and under feeding It is true that objections have been raised, but these have been based on theoretical fears We are not yet learned enough to forecast from theory whether the filled stomach will bleed more than the empty one, we must simply try and see Those who have not tried should do so, for the principle that Meulengracht has brought forward and re emphasised now stands established

For the rest, Professor Meulengracht summed up his treatment of the peptic-ulcer patient, bleeding aside, in the words "rest, relaxation, feeding", alkalis, belladonna and other procedures aimed at the local lesion were for him of less-er importance He paid tribute to the work of DAVIES and MACBETH WILSON, whose investigation of the psychology of ulcer patients had made the scales fall from his eyes" The second striking thing about the meeting was that nearly every speaker accepted the view that emotional factors are of prime importance in the genesis and therefore in the treatment of ulcer The thesis put forward by DAVIES and MACBETH WILSON in their new paper which we publish on another page is that the ulcer patient possesses all his life a certain kind of personality or psychological make-up, and that the development of his ulcer or ulcer-dyspepsia is determined by disturbing situations or events, especially those that threaten his economic security, increase his responsibility, or concern the members of his family The present paper tests the second part of the thesis on 50 cases of ulcer-hæmatemesis and 25 cases of ulcer-perforation, arguing that either of these complications is prima facie evidence of unusual activity of the ulcerative process, and showing that in the majority of the cases the bleeding or the perforation was shortly preceded by a major disturbance in the patient's personal life These case-histories make interesting reading, and they support the thesis well Most physicians will be able to add examples from their own experience, more often perhaps from among their friends and colleagues who have ulcers than from their hospital patients whose lives they know less well And most physicians will accept the views of DAVIES and WILSON as a crystallised and documented statement of what they themselves already appreciated in outline They will do so the more readily since the technique of this investigation is no subtle psychological mystery but simply that of the observant novelist freed from the need to disguise his sources

The psychosomatic connexion through which a financial crisis precipitates a hæmatemesis is still obscure There is experimental evidence that stimulation of the hypothalamic region can influence the movements and secretion of the stomach, but it has yet to be shown how human emotional states do bring about gastric or duodenal changes in subjects constitutionally predisposed to them That is a task for the psychologist and the applied physiologist to tackle together What more concerns the bulk of us is the bearing of these views on treatment Presumably it is beyond our power to change the psychological make up that characterises the ulcer patient All we can do is to protect him as far as possible from financial anxiety, increased responsibilities, and the worries of illness in his family To do that completely would need a perfect communist state, and would take all the zest out of his life How the ambitious, energetic ulcer bearer must inwardly resent this teaching! Or if he accepts it, his disability must be as galling to him as a withered leg, and he must be as sensitive about comment on it as a man with a gross physical deformity Is there no alternative or compromise? Is there no way by which the ulcer patient may learn to face most, if not all, the stresses of an active life with impunity? To appreciate and accept the relation between disturbing events and activity of his ulcer is clearly the first step, and a most important one It will point the way to a judicious use of rest and relaxation, as well as of diet, by the individual patient It will lead him to a more intelligent management of himself, and save him from a blind and often unavailing faith in alkaline powders, the avoidance of meat new fangled injections, or surgical operations

EDUCATION UNDER DIFFICULTIES

In modern war capacity for leadership and the offensive spirit are not enough; the trained intelligence is now every bit as valuable as in civil life. We are glad to read in a War Office pronouncement that "potential officer material" will not be sought in the first instance from boys leaving secondary schools at 18 or 19. Training will begin with the age-group 20–26, followed by that of 26–31. The younger men are urged to continue their avocations, to refrain from trying to enter the services, and to keep themselves fit. The authorities should recognise, too, that teaching requires the retention of the best teachers, and many of these are young men whose urge to serve in the forces should be treated with the same wisdom as that of their pupils. In one respect the problem of medical education is straightforward. Large drafts of medical men have already been provided for the defence services, and many more have been removed from ordinary practice to serve whole-time in emergency hospitals. The demand for doctors must therefore continue to be large, and moreover the mobilisation of the young men will do little to lessen the work of general practitioners and the public health services, for it has always been the women and children and the elderly who have made the greatest demands on them. The need for new licencees will then be urgent, and from the beginning of war preparations the Government have wisely recognised that those who are well launched on their medical studies must be conserved, and while university undergraduates have now been warned that they may be called up at the age of 20, medical students will remain immune.

The medical schools must be protected from disorganisation as far as possible. Many of their staff had territorial and reserve commitments and have already gone, and their replacement is not going to be easy. The position is further complicated by the extensive readjustment that has been necessary in hospital accommodation. Fortunately war came in the vacation, and there has been time for arrangements to be made, but even so modifications in the medical curriculum are likely to be unavoidable. Where senior students are attached to base hospitals near the danger areas the difficulties of lodging and transport and hospital staffing will encourage the practice of residential clerkships and dresserships which the General Medical Council has advocated. This return to a controlled form of apprenticeship in medical education will be a gain. In the provincial schools, which are to receive students from more dangerous places, the teaching hospitals have lost many of their available beds and clinical teaching will have to be spread over groups of hospitals, including those controlled by the local authorities, to a greater extent than formerly. The breaking of fresh ground may turn out to be as desirable in medical teaching as in farming. Students drafted to the big municipal hospitals are finding an unexpected wealth of clinical material, and those attached to mental hospitals are gaining an experience that has never before come the way of undergraduates. Systematic instruction under these conditions will require much ingenuity, but fortunately the plans outlined on page 757 suggest that this is forthcoming. It is unfortunate that the peculiar status of the General Medical Council in relation to medical education seems to preclude its taking the initiative and offering the central guidance which would now be so useful. But the Minister of Health was himself at one of the medical schools and should therefore take a professional view of their interests.

NEPHRITIS AND NEPHROSIS

TWENTY-FIVE years have elapsed since VOLHARD and FAHR published their famous monograph, Die Brightsche Nierenkrankheit, in which nephrosis was clearly separated from glomerulonephritis. Following MÜLLER, nephrosis was defined as an affection of the kidneys in which degeneration was predominant and inflammation played a secondary part. The group included the symptomatic nephroses, complicating conditions such as amyloid disease and eclampsia, as well as the so-called simple nephrosis of Bright's disease, which later came to be known as lipoid nephrosis. This distinction was widely accepted during the last decade, controversy centering round the primary cause of the disorder, whether metabolic or renal, and the relationship of nephrosis to glomerulonephritis. It was recognised that a group of cases exists in which the clinical picture is initially that of nephrosis—massive œdema, albuminuria and oliguria, without hypertension, renal failure or hæmaturia—and yet later on hypertension and nitrogen retention may develop. Such cases seemed to form a link between glomerulonephritis and nephrosis and have been called nephrotic nephritis or nephritis with a nephrotic *Einschlag*—a term not readily translated or defined.

The validity of VOLHARD and FAHR'S separation has now been questioned. BELL[1] claims that chronic proliferative glomerulonephritis may sometimes reproduce completely the clinical syndrome which we have been accustomed to call lipoid nephrosis. Nephrosis, he thinks, is a form of glomerulonephritis in which the glomerular capillaries remain open and allow the plasma proteins to escape into the urine. Following FAHR, he regards thickening of the basement membranes of the glomerular capillaries as characteristic of this group, which he terms rather unfortunately the membranous type of glomerulitis. The acceptance of this change as a diagnostic feature has, however, led him to include cases which, on clinical grounds alone, would not be admitted by most authorities as examples of nephrosis. Moreover, in 25 cases diagnosed clinically as lipoid nephrosis, there were 6 which showed no glomerular changes even though the history was as long as sixteen months. Arguing in a circle, BELL maintains that the capillaries must have suffered damage because of their permeability to plasma proteins, and their failure to respond by thickening was connected with the

1. Bell, E. T., *Amer. J. Path.* 1938, 14, 691.

youth of the patients. Yet in 2 other of his cases, aged twelve and thirteen years, the thickening was striking. Obviously this glomerular capillary change is not as significant as BELL would have us believe. In this country, DUNN[1] has adopted a somewhat similar view. He too has stressed the abnormal permanent patency of the glomerular capillaries in nephrosis and has suggested that it was perhaps the result of previous inflammation. He has also observed abnormal thickening of the basement membranes in certain of his cases.

While the tide is now running against the conception of nephrosis as an entity distinct from nephritis, advocates for the opposite view are not lacking. PANTIN,[2] working at the nephritis clinic at Guy's Hospital, has made a statistical study of glomerular size in nephritis, nephrosis and the normal kidney and has found that glomerular enlargement is a constant feature in glomerulonephritis, whereas in nephrosis there is no measurable difference from the normal. His 6 cases of nephrosis showed in fact no glomerular changes at all. Confirmation of his observations in a larger series would help to keep the controversy alive.

WHAT IS AN URGENT CASE?

DURING the past three weeks many people have been asking themselves the meaning of the word "urgent," for our hospitals have been dealing only with urgent cases. It soon became clear that the word had to be extended beyond such familiar emergencies as intestinal obstruction and compound fractures. There were, for instance, cases of ear disease to be observed for a time before making a decision for or against operation. Those working in the London voluntary hospitals have been thinking over this matter since the emergency bed service of the King's Fund was introduced. Under this scheme the hospitals agreed to take any case sent up as an emergency by any doctor without selection, in the way that the municipal hospitals have always done. The most striking thing about this service has been the number of times when the emergency has proved to be a false alarm, and the patient has been well enough to return home next day or the day after. This does not mean that the trouble was not urgent in the first place. The urgency must be assessed by the considerations in the mind of the doctor at the moment he sees the patient, and not on the report of the case when the patient is well again. Students have been taught for years that in certain conditions immediate transfer to hospital is necessary if a life is to be saved. We cannot criticise the man outside for failing to send in the acute appendix which might have been saved, and then turn round on him and grumble because he sends in all those other patients whose symptoms were identical at the moment he saw them but who were well next day, and back at work the day after.

But here is the difficulty. When a patient has been admitted as an emergency it is impossible to send him out next day, and difficult to do so on the day after. He may have to be kept in for a week to be investigated so as to exclude possible chronic disease, of which the acute symptoms were merely an exacerbation, and when a patient has been kept in hospital for a week we cannot think of sending him back to work for another week. The results are a strain on hospital beds, a large call on national health insurance funds, and, perhaps most important of all, the manufacture of invalidism in many of that great group of patients in whom no organic disease is discovered. Perhaps good may come from the present stringency of beds by giving courage to hospital doctors to send out these cases in forty-eight hours. That they should be admitted we can hardly doubt, when it is remembered that the hospital medical officer is to the doctor outside what the latter is to the patient. It is well known that of a hundred emergency calls the anxiety of the relatives is the only reason for ninety-eight. In the ninety-ninth the doctor saves a life, and in the hundredth—usually the one to which he does not go—the patient dies, but would have died anyhow. The public have been taught that certain symptoms are signs of grave disease and that they must call in their doctor at once. Through its insurance committees the nation demands that the family doctor should go out at all times and in all weathers to see such patients. It would be most unjust to deprive him of the power to deal with such cases if he finds the patients' fears may be justified. The criterion of urgency in the G.P.-patient relationship is the anxiety of the patient and his relatives, while in the hospital-G.P. relationship it is the suspicion rather than the certainty of serious disease.

But there is another way in which the relativity of the word urgent is being demonstrated. As our patients return to the outpatient departments which are now opening again we have to ask ourselves to whom shall precedence in admission be given? This will need careful consideration. It would probably do no harm, with the coming of the winter, if all tonsillectomies in children were deferred until the spring. On the other hand, the ingrowing toenails, the hammer toes, and other minor maladies of the feet that form the most important work, from the national standpoint, of our orthopædic departments, become increasingly urgent as the limitation of transport compels the population to resort to its legs. Precedence must also be given to those cases of malignant disease in which there is a hope of cure. Here also our knowledge may be extended if clinicians have to distinguish more carefully between cases in which hope really exists and those in which operative surgery is but a placebo and radiotherapy a mask of black magic. Nor must it be assumed that delay is a misfortune. A wait for three weeks will not have materially affected those growths which are curable, the rapid development of others should not be interpreted as a missed opportunity, for it may all too often be evidence that the growth was from the first incurable with our present powers.

1 Dunn J. S. *J. Path. Bact.* 1931, 34, 1.
2 Pantin C. G. *Guy's Hosp. Rep.* 1932, 82, 456.

ANNOTATIONS

CHEMOTHERAPY IN ANTHRAX

Two papers on experimental anthrax in our last issue (pp 681 and 685) open another chapter in chemotherapy with the sulphonamide group. Both workers used mice for their experiments and injected strains of *B anthracis* of known virulence Dr. May shows that M. & B. 693, and to a less extent sulphanilamide and sulphone, prolonged life in the animals infected with fully virulent capsulated non-sporing anthrax bacilli, although these drugs did not prevent ultimate death. Dr Cruickshank has obtained similar results, but when very large doses of M & B. 693 were given (60 mg. by the mouth plus 40 mg. subcutem) daily, he found that a considerable proportion—30–37 per cent according to the size of the infecting dose—survived, while no organisms could be recovered from the tissues As the author notes, these mouse doses multiplied weight for weight would imply an enormous dose of M. & B 693 for man. Dr Cruickshank concludes by speculating whether this drug would enhance the effect of a specific antiserum Dr. May answers this question with experiments which show that there was no apparent increase in the protective action of an anti-anthrax rabbit serum when used in combination with M & B. 693 The dose of the drug administered was, however, considerably smaller than that used by Dr Cruickshank in his survival experiments. Much of the importance of both these records lies in the biological character of the anthrax organism Like the pneumococcus, against infections with which M & B 693 has been so successful, *B. anthracis* possesses a well-defined capsule Numerous workers cited by Topley and Wilson [1] have, however, shown that the capsule is chemically different in the two organisms In the case of the anthrax bacillus a protein-like substance has been obtained from the capsule and a polysaccharide from the body, whereas in the pneumococcus the main part of the polysaccharide fraction is in the capsule Although its precise nature varies with the different types of pneumococcus, this polysaccharide portion is probably fully antigenic; but the polysaccharide fraction in the body of the anthrax bacillus is not, and the antigenic properties reside in the protein fraction of the capsule. It may be recalled here that a fraction has been extracted (Stamp [2]) from a hæmolytic streptococcus with dilute ammonia which is capable of antagonising the bacteriostatic action of both sulphanilamide and M. & B 693, and that this fraction is free from protein and consists of a mixture of substances of relatively low molecular weight, including free amino-acids. Obviously the chemical composition of the bacterial cell is of paramount importance in chemotherapy, whether of pneumococcal or other infections The results of Dr. May and Dr. Cruickshank in the case of anthrax are in harmony with this view and offer a hope of success in a disease which is usually fatal both in man and in susceptible animals

THE HISTOLOGY OF THE LUNG

FURTHER information about the structure of lung tissue is provided by Engel and Newns.[3] They examined microscopically the lungs of 196 children between the ages of six weeks and twelve years, using several methods of differential staining to define exactly the amount and distribution of smooth muscle in the lung parenchyma Serial sections, from 10 to 35 μ, were cut from paraffin-embedded material and camera-lucida drawings were made The structural details were followed in 27 selected cases by spreading out the drawings on a large table, marking particular groups of muscles and following the marked groups from drawing to drawing Certain interesting results justified the labour entailed.

Contrary to the accepted description,[4] no muscle-fibres could be found in the visceral pleura or in the interstitial tissue of the normal child's lung The terminal bronchioles and the mouths of the air-spaces all contained slender muscle-fibre bundles, Single fibres occurred up to the periphery of the ductules In a number of lungs where an antemortem solidifying process had been present (chronic congestion, chronic pneumonitis or miliary tuberculosis), the lymphatics of the interstitial substance were surrounded by muscle bundles and occasional isolated strands were seen radiating from them. All the muscle groups of the air-spaces were larger and more prominent, the change being at the expense of the elastic tissue Engel and Newns feel that, as Maxwell Ellis has shown for the larger bronchi [5] and Engel for the bronchioles,[6] the muscle of the interstitial and acinar tissue has a tonic-supporting function. Where the lung remains solid for some time the extra demands made on the muscle to preserve the patency of the air-spaces and lymphatics result in its hypertrophy This hypertrophy can be extreme—as in one of their cases and in the one described by Baltisberger—and this excessive reaction is perhaps attributable to a congenital predisposition. The same predisposition is possibly a factor in the causation of asthma

REGULAR OR ROUTINE EXAMINATIONS FOR CANCER?

As soon as it was realised that cancer is a local rather than a constitutional disease the need for early diagnosis, before metastasis occurs, became apparent But when a few years ago proposals were made for an educational campaign designed to lead the public to undergo regular examination for cancer, two objections at once became obvious In the first place it was useless to enlist the coöperation of the public until there were adequate facilities for diagnosis, and for immediate treatment. In certain centres these opportunities are to be found, but no nation-wide appeal could reasonably be made until all cancer-bearing patients already presenting themselves could be dealt with It was to remedy this deficiency that the Cancer Act was recently introduced and passed. One may suppose that if peaceful conditions had continued the Government would soon have been in a position to urge all adults over a certain age to submit to regular examination for malignant disease The fate of this part of the programme will depend on peace, prosperity and the reconstructed health plan of the nation when this war is over.

The second objection raised to a campaign for early diagnosis is that the public would not coöperate; and this would have been much harder to counter. It is true enough that, as the Minister of Health said in introducing the Cancer Bill, public opinion has changed in regard to tuberculosis, and may now do so towards cancer But the individual's objection to

1 Principles of Bacteriology and Immunity, London, 1936.
2 Stamp, T. C., *Lancet*, 1939 2, 10
3 Engel, S., and Newns, G H., *J Path. Bact.* September, 1939, p 381
4 Baltisberger, W., *Z ges Anat* 1921 (Abt I), 61, 249
5 Ellis, M., *Lancet*, 1938, I, 819.
6 Engel, S., *Ann. Padiat.* 1939, 153, 263

regular medical examination is more profound. Robust people hate to be reminded unnecessarily of the ills of the body, hence they have an inertia towards physical probing. Even the injunction to visit the dentist every six months is ordinarily ignored—chiefly because it is too much of a bother. One doubts therefore whether even in a regimented population success would attend a scheme such as was introduced this year in Danzig by which women over 30 and men over 45 were enabled to undergo an annual examination for cancer free of cost to themselves.[1] A large number of people in almost any population will pay one visit of this nature to the doctor, and all the hypochondriacs will pay them regularly, but will they keep it up in year after year of good health? On the other hand, figures such as those published by Löwen[2] and by Mikulicz-Radecki[3] from Königsberg carry conviction about the need for *routine* examination for cancer of all patients seen. The method they extol and call "Reihenuntersuchung" is no more than every medical student is taught. The word itself implies a series of examinations, and so far as the early diagnosis of cancer is concerned the series must be made on the same patient. No data are given by either author of repeated examinations of the same people. One or two visits only to the doctor some time after the age of 30 will not achieve the saving of life that an early diagnosis campaign foresees.

ALL ABOUT DR. MAVOR

After tumbling in the hay with Dr. Gogarty we may now take a roll in the heather with Mr. Bridie (once Dr. Mavor), who has described for us the doctor's way of living for the past fifty years.[1] He has dashed off the biography while waiting for an interview with St. Peter, and between the chapters we listen with respect to his encounters with Mrs. Aphra Behn, Barrie, Colley Cibber, and other stimulating company who drop in to offer him advice and criticism. (With bated breath we hear him address Marlowe as a "bombastic old blatherskite.") Dr. Mavor was a Lowland Scot who was educated at Glasgow Academy and studied medicine in a leisurely fashion at Glasgow University. He had a theory—which he proved at the fifth attempt—that the whole of anatomy could be learned in a fortnight. This left him time to help edit the university magazine and to go camping with his cronies in Arran, where "one surrounded oneself with every conceivable discomfort and then drank bottled beer to forget them." He lived through a hectic rectorial election, when he and the present Minister of Health evolved a song (in Welsh) in support of Mr. Lloyd George, which may have been one of the reasons why Lord Curzon was elected. After qualifying young Mavor had only time for a short attack of house-man's head before he was overwhelmed by the last war. He served in France with the R.A.M.C., and later he was sent to Mesopotamia. Mr. Bridie does not believe in pandering to his readers. Dr. Mavor's life in the East was described in a book published in 1926 and if the reader is now unable to obtain a copy of that book, Mr. Bridie is unmoved and refuses to repeat the tale. So we soon return to Glasgow where Mavor, after he had been demobilised set up in general practice. He also spent some time helping at a psychotherapeutic clinic for shell-shocked veterans where he decided that to build up a personality is a job only to be undertaken by Socrates, Christ and Confucius working in the closest cooperation. In 1923 with a bank balance of £13 4s. 1d., Dr. Mavor married, and soon he was appointed professor of medicine at the Anderson College of Medicine. But already his metamorphosis into James Bridie had begun. He was writing plays for the Scottish National Players, and by way of Birmingham and Malvern he had soon reached London and the West End stage.

Mr. Bridie says that a Scotsman is a good biographer but a bad autobiographist, certainly he is to be congratulated on his study of Dr. Mavor.

1 One Way of Living. By James Bridie. London: Constable and Co. 1939. Pp. 99. 8s. 6d.

ACTION OF T.N.T. ON THE BLOOD

With the outbreak of another European war closer attention must again be paid to poisoning by trinitrotoluene, which was first put forward as an explosive in 1891. During the war of 1914–18 Livingstone-Learmonth and Cunningham[1] described the effects of T.N.T. on women working in the filling sheds of munition factories, where the work necessitated intimate handling of the powder. They classified the symptoms into two groups—*irritation* and *intoxication*. The latter included the following referable to the circulatory system: faintness, giddiness, hot and cold flushes, pallor, slight cyanosis, occasional palpitations, swelling of hands and feet, and occasional ecchymoses. A special susceptibility was also noted in certain women—namely, those "inclined to anæmia," those with previous gastric, hepatic, throat, or chest trouble, those who sweated profusely or were unclean in person, alcoholics, and those with lowered vitality due to over-fatigue or malnutrition.

In an official communication from the Ministry of Munitions,[2] the blood changes in T.N.T. poisoning were described thus: they "appear to be the same kind as, though less in degree than, those mentioned already for D.N.B." (dinitrobenzene). "The presence of methæmoglobin may be demonstrated commonly in the blood of workers, though cyanosis and breathlessness are much less evident than in the case of D.N.B. poisoning." The changes in D.N.B. were referred to in the following terms:

"As in nitrite poisoning, there is a conversion of oxyhæmoglobin to the more highly oxidised form methæmoglobin. Beyond this there may be, when the poisoning is more severe, hæmolysis, with degeneration of the corpuscles and escape of methæmoglobin into the plasma. In severe cases evidence will be found not only of destruction of red corpuscles but also of activity in the blood-forming organs, nucleated red corpuscles may be found in severe cases, with evidence of imperfectly developed corpuscles, as shown by the occurrence of basophile granulations, polychromasia, and variations in shape and size. Lymphocytosis may also occur."

This description of the blood changes in D.N.B. poisoning appears to be based on Malden's report,[3] in which he said that the red cells were considerably reduced in number, varied in size and shape, and constantly showed basophil granulation, nucleated red cells were occasionally present, hæmoglobin was decreased, the colour index was normal, the white cells showed a total increase with a relative decrease of polymorphs, and the number of eosinophils was sometimes, and of mast cells more often, relatively and absolutely increased. In commenting on the note sent to us by the Ministry of Munitions we remarked that "the points of analogy between dinitrobenzene poisoning and trinitrotoluene poisoning are rendered additionally interesting by the resemblance of both

1 Livingstone-Learmonth, A., and Cunningham, R. M. *Lancet*, 1916, 2, 261.
2 *Ibid.* p. 1026.
3 Malden, W. *J. Hyg. Camb.* 1906, 6, no. 5.

conditions to chloroform and to 'dope' poisoning" (due to tetrachlorethane).[4]

In 1921 a report to the Medical Research Council[5] showed that among the clinical features observed in T.N.T. poisoning was anæmia; which in its more severe forms was aplastic. In experimental work on animals it was possible in only two animals to induce changes similar to the aplastic anæmia and toxic jaundice as seen in man. These changes were not due to direct hæmolysis by T.N.T. The extreme reduction of the blood-forming marrow was the chief effect of the poison in the cases of aplastic anæmia. The cell-count was thus that of a rapid progressive primary anæmia with a high colour-index. Further details of the blood changes are now given by Bizzarri,[6] who has found in experiments on guineapigs that effects are produced on red cells, white cells, and platelets, some by the toluene group, and others by the NO_2 group of trinitrotoluene. The red cells are increased by the NO_2 group, and one of several types of anisocytosis, either macrocytic or microcytic, is constantly produced by the toluene fraction. A slight poikilocytosis may also be found. There is a leucopenia, due to toluene, with slight eosinophilia and a relative monocytosis, and a shift of the Arneth count to the right. The number of the platelets is slightly decreased by the effect of toluene.

In his latest annual report the chief inspector of factories records that last year there were five cases of "aniline poisoning" and one case of toxic jaundice due to contact with T.N.T. in a shell-filling factory.[7]

THE PSYCHO-BIOLOGICAL APPROACH TO PSYCHIATRY

BEFORE astro-physics and biochemistry had put understanding of the external world out of the reach of the ordinary man, the search for the nature of reality as revealed by science was open to anyone who cared to pursue it. It was remarkable that each new step which threw light on that reality evoked a storm of resentment. So conservative and so anxious for the security of the established order was man. But nowadays things have changed. If tomorrow the fundamental nature of the electron were discovered, or the dynamic quality of living protoplasm were revealed, it is doubtful that it would cause much stir. But this does not apply to psychology, and it is doubtful if it ever will. The investigation of our internal environment is so bound up with our own emotional conflicts that we shall always feel a bias towards this science. With the new dynamic view of the mind came a wealth of data and theory which split up psychiatrists into the various schools of today. In this country the general attitude towards dynamic psychiatry has been that of the fence-sitter—recently advocated in these columns.[8] In America, where there is a much greater tendency to accept broad generalisations, some measure of accord has been reached.

Followers of the psycho-biological school of Adolph Meyer and Diethelm will recognise in Dr Arthur Noyes's book on clinical psychiatry[9] the same fundamental theme which has attracted so much attention in recent years. The pure but sterile atmosphere of Kraepelinian description of clinical types has been reinforced by a vital psychology which envisages man as a psycho-physical unit striving to keep equilibrium in potentially hostile internal and external environments. Normal behaviour and psychotic symptoms are explicable as phenomena of this equilibrating process. Psychic energy is considered to be intimately bound up with physical processes, and it is postulated that there is "presumably a reciprocal relation between psychic energy and nerve energy, the physico-chemical basis of the latter existing in the Nissl bodies of nerve cells." The concept of the libido is given a much wider meaning than it is by Freud or Jung. Noyes regards it as "that aspect of biological energy which continues the race pattern and motivates the psycho-biological drives of the individual." The instincts derive their energy from this common source. Most of the better-known Freudian mechanisms are described and accepted, but it is a relief to discover that conscious control has still a large part to play in behaviour and in the promotion of normal mental health.

When considering disease processes, Dr Noyes constantly reminds us of the dynamic unity of the individual and bids us treat the total organism. A stimulating though perhaps naïve example is given in the chapter on paranoid psychoses. It is known that death in such patients is more often due to degenerative circulatory disease than in the other biogenetic psychoses. The author states—"the antecedent hypertension and cardiac hypertrophy followed by subsequent degeneration and failure when the demands of the cardio-vascular system become too great represent a compensatory somatosis associated with a compensatory psychosis."

This is probably the only modern text-book which gives any detailed account of insulin and cardiazol shock therapies. Much of the best research of the last five years is included. A new chapter has been added on psychiatry and general medicine, which, while perhaps out of place in a book for psychiatrists, contains material which any surgeon or general physician will find valuable. The author concludes with some words of Fritz Mohr—"there is no such thing as a purely psychic illness or a purely physical one, but only a living event taking place in a living organism which is itself alive only by virtue of the fact that in it psychic and somatic are united in unity."

LEISHMANIASIS IN EUROPE

CONCLUSIVE evidence, including the culture of *Leishmania tropica*, is brought forward by Poggi and Monti[10] that, in an extensive area comprising about a dozen townlands in the valley of the river Conca, which lies in the Italian provinces of Forlì and Pesaro on the Adriatic coast, many cases hitherto diagnosed as lupus are in reality oriental sore. No mention is made of the species of sandfly concerned in this district. Although *Phlebotomus papatasii* had hitherto been held responsible for oriental sore in Europe, Vanni[11] inculpated *P. macedonicus* (Adler and Theodor 1931) alias *P. perfiliewi* (Parrot 1930)[12] in one case in Abruzzi, and a typical oriental sore was produced in a rat by inoculation with the products of trituration of two thousand specimens of *P. perfiliewi* caught locally.[13]

In France Giraud, Bergier, and Cabassu[14] report that human leishmaniasis (kala-azar), observed at

4. *Lancet*, 1916, 2, 1021.
5. *Spec. Rep. med. Res. Coun., Lond.* no. 58, 1921, cited in *Lancet*, 1921, 1, 657.
6. Bizarri, M., *Fol. med.* Aug. 15, 1939, p. 801.
7. See *Lancet*, Sept. 9, 1939, p. 616.
8. *Lancet*, Aug. 19, p. 436.
9. Noyes, A. P., Modern Clinical Psychiatry (2nd ed.). Philadelphia and London: W. B. Saunders Co. 1939. Pp. 570. 22s. 6d.
10. Poggi, L., and Monti, G., *Ann. Igiene*, June, 1939, p. 375.
11. Vanni, V., *Ibid*, September-October, 1938, p. 520; see *Lancet*, 1939, 1, 886.
12. Jerace, F., *Ibid*, May, 1939, p. 309.
13. Vanni, cited *Ibid*, June, 1939, p. 398.
14. Giraud, P., Bergier, P., and Cabassu, H., *Soc. méd. Hôp. Paris*, March 31, 1939.

Marseilles from 1923 to 1938, averaged 6–10 cases yearly, reaching a maximum of 24 in 1932, and that the incidence of canine leishmaniasis in the same area was closely comparable with the human as regards both geographical distribution and seasonal variation This appears to confirm the hypothesis that Mediterranean kala azar is a canine disease only occasionally communicated to man Since it was not clear that the disease was conveyed by sandflies or by fleas, it is suggested that the carrier is a tick, a theory which is supported by the fact that the disease is commoner among watchdogs and sporting dogs of suburban and country districts than among canine pets in towns

DISTANCE FACTOR IN GAS WARFARE

THE extent to which war gas will travel along the ground in dangerous concentrations is naturally an important question, not only for combatant troops but also for auxiliary services Wind currents will break up and dilute vapour and the lighter a gas is, the more quickly is it dispersed Denser and heavier gases may be carried down wind a long way and distributed over a wide area before they lose their virulence Figures based on theory are apt to be falsified Prof Gullert[1] of Berlin states that phosgene will not rise higher than about fifty metres but will spread at an angle of over 30° He gives a table which shows that a concentration of 1 4 per cent at the site of release may have thinned at three thousand metres to 0·004 per cent In favourable (or perhaps unfavourable) circumstances phosgene may be effective more than twenty kilometres away and detectable up to thirty kilometres The phosgene which escaped by accident at Hamburg in May, 1928, caused 130 casualties between two and seven kilometres away and was detected at fourteen kilometres If the air is still and humid, heavy insoluble gases may retain a high concentration at relatively long distances In 1930 an escape of an industrial gas (fluorine) filled a part of the Meuse valley over an area twenty five kilometres long and one or two kilometres wide, and caused 63 deaths in a single day[2] War gas also hangs about obstinately in woods Obviously it is impossible for troops anywhere near the line to feel quite safe Gas is, indeed a clumsy weapon, and may be abandoned on grounds of pure expediency

POLIOMYELITIS VIRUS IN FÆCES AND DRINKING-WATER

LAST year Trask, Vignec and Paul pointed out that when a filter (Chamberland or Berkefeld) is used in attempts to isolate poliomyelitis virus from fæces the concentration of the virus is likely to be so low that it may not infect animals into which it is injected, They suggested that filtration can be dispensed with when the stools are treated with volatile antiseptics such as ether or acetone Having adopted this suggestion Kling, Olin Magnusson, and Gard[3] report the case of a 7 year old boy who developed non-paralytic poliomyelitis in the autumn of 1938 After his recovery, his stools were treated as prescribed by Trask and his colleagues and a monkey (*Macacus cynomolgus*) was given an injection into the peritoneal cavity and another into one of its sciatic nerves Paralyses ensued, and autopsy revealed the changes characteristic of experimental poliomyelitis A *Macacus rhesus* was successfully inoculated with material from the first monkey, and the disease was transmitted from the second to a third monkey Subsequent tests with the stools of the same child suggested that their content of the virus of poliomyelitis was gradually waning, for when a monkey was inoculated 31 days after the first inoculation only an abortive form of poliomyelitis developed, and the result of a further test 120 days after the commencement of the illness was wholly negative

These investigations were brought to the attention of the French Academy of Medicine on June 13 of this year, and on July 18, before the same forum, Lépine, Sédallian, and Sautter[4] described related findings They said that on Nov 8, 1938, a man aged 28, living in the neighbourhood of Lyons, was admitted to hospital moribund from an exclusively bulbar form of acute anterior poliomyelitis It transpired that his two children had been feverish about the time that he had fallen ill, but had recovered without developing paralyses The stools of one of these children, treated in the manner described by Trask, Vignec, and Paul, yielded a fluid whose injection into a monkey (*M rhesus*) gave rise to typical experimental poliomyelitis About a month later, the child's stools were again tested against a monkey (*M cynomolgus*), which in its turn developed poliomyelitis with paraplegia, the post mortem changes being typical of experimental poliomyelitis When the stools were tested once more, about four months after the child first fell ill, the inoculated monkey developed only a transitory paralysis, followed by complete recovery About a month later the same monkey was found to be resistant to an intravenous injection of poliomyelitis virus It thus seems that the first inoculation of this monkey with material taken from the child's stools had made it immune to experimental poliomyelitis The blood of the same child also seems to have acquired defensive properties against poliomyelitis, for when the child's serum was mixed with a laboratory poliomyelitis virus, the monkey inoculated with the mixture remained well, whereas a control monkey inoculated with the same virus, to which no serum had been added, became paralysed and died

The latest observations on similar lines have been made at the Swedish State Bacteriological Laboratory under the direction of Professor Kling, who has been paying special attention to drinking-water as a possible source of poliomyelitis Numerous samples of water taken from homesteads and districts invaded by poliomyelitis have been tested and, in 1 out of 26 samples examined, what appears to be the virus of poliomyelitis has been found The sample was taken from a homestead in which a case of poliomyelitis had been diagnosed the day before, and on its effect on monkeys the virus obtained has so far conformed to the standards by which the virus of poliomyelitis is at present identified Nevertheless we understand that Professor Kling is as yet reluctant to commit himself to anything more than a provisional claim that his virus is identical with that of poliomyelitis of which there are known to be several serologically different strains It will be interesting to see his report to be published in the medical press in the near future

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Captain A. G Elliott, who has been house governor of the London Hospital for 37 years, has retired and Captain H Brierley has been appointed to succeed him Captain H L Milsom, the secretary, is also retiring because of ill health.

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1 Gillert F *Med Klin* Aug 11 1939 p 1071
2 See *Lancet*, 1930, 2 1305 1937 1, 937
3 Kling, C., Olin, Magnusson and Gard, *Publ Acad Med* June 19 1939 p 826
4. Lépine P., Sédallian, and Sautter, *Bull* July 18, 1939 p 141

SPECIAL ARTICLES

ÆTIOLOGY AND TREATMENT OF OSTEO-ARTHRITIS

By T. T. Stamm, M B Lond., F R C S

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For many years confusion has existed in the minds of medical men about the significance of the articular changes called "osteo-arthritis" The relationship between these changes and such conditions as rheumatoid arthritis is often misunderstood. Although in such standard textbooks as Taylor's and Osler's the importance of trauma as an ætiological factor is emphasised in relation to the monarticular forms, no reason is given for these changes occurring in a polyarticular form or for their appearance in the later stages of rheumatoid arthritis Although stress is usually laid on such ætiological factors as infection, metabolic disturbances, and exposure to cold and damp, again no explanation is suggested why in some cases they produce a degenerative type of arthritis and in others proliferative or osteo-arthritic changes; nor is any suggestion made of a possible mechanism by which these changes could be produced

This confusion and uncertainty is unfortunate from the point of view of accurate diagnosis and for a clear conception of the forces at work in any particular case, but doubly unfortunate from the point of view of treatment; for, unless we have some conception of how a disease is produced, treatment must remain purely empirical.

In the Royal National Orthopædic Hospital and in the orthopædic department at Guy's Hospital I have been able to study many cases exhibiting the signs that we regard as characteristic of osteo-arthritis—namely, degeneration and wearing away of the cartilage in the central areas of the articular surfaces and eburnation of the underlying bone, associated with hypertrophy and overgrowth at the edges of the joint and the formation of osteophytes, and in the later stages hypertrophic changes in the adjacent parts of the synovial membrane, with the formation of adhesions and villous projections As a result I have come to the following conclusions. (1) osteo-arthritis does not develop primarily in a joint which is otherwise normal; (2) it only develops in joints already the seat of one of the various forms of arthritis or in joints whose physical conditions have been altered by trauma, usually of one of the articulating bones concerned; and (3) it is a truly mechanical arthritis, even when it is polyarticular.

Ætiology

Excessive wear takes place in the moving parts of any machine when they are subjected to abnormal stresses and strains through alteration in the physical conditions under which they work. This must apply equally to living joints; but, since living tissues always react in some way to altered physical conditions the complete clinical picture of a living joint which is the seat of excessive wear shows changes which are the direct result of pure mechanical wear, plus changes resulting from the reaction of the tissues of the joint.

I intend to show that this admittedly theoretical picture conforms exactly with the condition called "osteo-arthritis" and to suggest that osteo-arthritic changes in a joint are always and only of mechanical origin. If this view is accepted, osteo-arthritis may be defined as the sum of the changes in a joint where excessive wear is taking place as a result of some alteration in its physical condition. The acceptance of this hypothesis leads to the clarification of some of the confusion surrounding the classification of the various forms of chronic arthritis, for nearly all types of chronic arthritis must eventually alter the physical conditions of the joint and tend to produce excessive wear and tear. In their later stages all forms of chronic arthritis are therefore liable to show changes characteristic of osteo-arthritis, but such changes are a consequence of the arthritis and not a part of it, and they must be discounted if a clear picture of the particular form of arthritis is to be obtained

What then are the changes which may theoretically be expected to take place when a living joint is subjected to altered physical conditions? As stated above, they will consist in: (1) changes due to mechanical wear, such as would develop in an inanimate machine of similar structure; and (2) changes resulting from the reaction of the living tissues to the altered stresses and strains to which they are being subjected

CHANGES DUE TO MECHANICAL WEAR

Failure of lubrication is the main cause of excessive wear in any machine. This may be due either to a lack of proper lubricant or to breaking of the film of lubricant by excessive pressure between the opposing surfaces. When either of these conditions is present in a joint, the affected areas of the articular cartilage begin to wear away. As a rule the central areas of the cartilage receive most of the stress and must therefore show the most wear Proper lubrication in any joint can be assured only when the opposing surfaces are not exactly parallel, so that point or linear contact is made between them The slight V-shaped gap thus formed on either side of the line of contact causes the lubricating fluid to be compressed and forced between the opposing surfaces on movement. When wear takes place, the surfaces tend to be ground into too exact a fit, and so the joint tends to "seize" and to move in a series of jerks This might reasonably be expected to cause transverse ridges and cracks in the cartilage, such as develop on the surface of a road, and may be partly responsible for the "fibrillation" of the cartilage so commonly seen in degenerating joints

REACTION TO THE TISSUES

To deduce the probable reactions of the joint to abnormal stresses and strains it is necessary to bear in mind what happens in other tissues when similar forces are applied In nearly all tissues the reactions are similar: when excessive steady pressure is applied, the tissues atrophy; excessive intermittent pressure, on the other hand, tends to produce hypertrophy and overgrowth. When, however, the tissues are subject to a degree of pressure or stress which they are designed to withstand, no abnormal reaction takes place

The skin of the heel affords a simple example illustrating these points The normal even pressure of the body-weight on the skin of the under surface of the heel does not evoke any reaction, and the skin remains soft and supple. At the edges of the heel there is continuous hypertrophy and overgrowth of the skin, and so everyone has a ridge of thickened

skin round the edge of the heel, presumably due to the excessive intermittent pressure to which this strip of skin is subjected owing to the smaller area available. The same reaction takes place when one metatarsal head becomes depressed. The skin underneath it is subjected to excessive intermittent pressure, and a callosity constantly develops. When, on the other hand, excessive, but continuous pressure is applied, as in a badly fitting plaster, the skin and underlying tissues atrophy and a pressure sore develops.

Similar changes may be expected in joints under abnormal conditions of stress. Thus, in the central areas of the articular surfaces, where pressure is continuous and most likely to be excessive, atrophy and degeneration of the cartilage may be expected. This, together with the mechanical wear already mentioned, causes the cartilage to wear rapidly away until the underlying bone is exposed, and being exposed, may be expected to attempt to reproduce an ordinary cortical surface, which will be moulded to the shape of the opposing articular surface by the movements of the joint.

At the margins of the joint, however, the pressure or stress, though it may become excessive, is intermittent, and in this situation hypertrophy and overgrowth must be expected. Cartilage cannot hypertrophy to any great extent, but the marginal bone can do so and there will be overgrowth of bone round the margins of the joint, comparable to the thickened skin round the margin of the heel. The synovial membrane in this peripheral area will be liable to be nipped or rubbed by the adjacent bony overgrowths. In this way raw areas may be caused which will tend to stick together and produce adhesions in the joint, and hypertrophy of the synovial membrane may result from the irritation and produce villous projections.

The clinical picture produced must vary in different cases, for the reaction of the tissues depends to some extent on the state of their blood supply and therefore on the state of the general circulation. It is well recognised that the hyperæmia caused by certain types of inflammation leads to atrophy and absorption of bone, whereas sclerosis of bone is often found where there is a diminution of the local blood-supply. When, therefore, the local blood supply is deficient, hypertrophic reactions round the margins of the articular surfaces tend to occur, with sclerosis of the bone ends. On the other hand, when there is hyperæmia, the atrophic changes usually predominate, and bony outgrowths may not be formed.

The complete theoretical picture of a mechanical arthritis therefore consists of a joint in which the cartilage, especially in the central areas of the articular surfaces, is atrophied, split with transverse ridges or fibrillations, or even completely worn away. At the margins of the joint there is hypertrophy, with a rim of new bone formation. The synovial membrane in this area may also be hypertrophied and heaped up into ridges, and there may be multiple adhesions. In fact, all the typical changes of osteo-arthritis can be explained on an entirely mechanical basis, and at the same time this hypothesis can satisfactorily explain the pathological results in all types of cases in which the mechanical state of the joints has been altered no matter what the primary cause of this change has been.

CAUSES OF ALTERATION IN MECHANICAL STATE

Fracture into a joint.—When the line of fracture passes across an articular surface and perfect reduction is not effected, a ridge will be left, and the cartilage along this ridge will be subjected to excessive pressure, and so it will degenerate and wear away. Further, owing to the altered alignment of the articular surfaces, abnormal stresses are likely to fall on other parts of the joint, and so generalised changes may also develop. If the joint is stiff as a result of the original injury, these effects will be exaggerated, and degeneration will take place sooner than would otherwise be the case. This factor of free mobility in a joint is most important from the point of view of traumatic arthritis. The greater the natural mobility of a joint, the greater the possibility of "play" between the articular surfaces which enables it to take up unusual stresses and strains, and therefore the likelihood of damage being sustained to the articular surfaces by their being impacted together is considerably diminished. For this reason a flail joint in a paralysed limb is very rarely the seat of osteo-arthritis, whereas some joints—e.g., the hip joint—are much more liable to osteo-arthritis than others because a deep ball and socket construction does not allow play between the articular surfaces, and all unusual stresses and strains must be taken through them. In the shoulder joint, on the other hand, there is such free mobility and play between the articular surfaces that they can very rarely be impacted together, and osteo-arthritic changes are correspondingly rare.

Fractures outside joints.—When a fracture does not properly unite, the resultant angulation of the bone may throw a neighbouring joint out of alignment, so that it is subjected to shearing strains. For example, a fracture of the tibia producing lateral angulation of the lower end throws the ankle-joint out of the horizontal, and so the body-weight acts as a shearing strain on the upper surface of the talus. This will very soon cause excessive wear, and osteo-arthritis will supervene as a result of the altered mechanics of the joint.

Rheumatoid arthritis primarily affects only the capsule and synovial membrane of a joint, but as a result of the changes in these structures the joint becomes stiff and there is a lack of secretion of synovial fluid. Subsequent use of the joint will lead to excessive wear of the articular cartilage owing to improper lubrication, and the joint will at the same time be subjected to excessive stresses and strains owing to its stiffness. Eventually, therefore, the features of a mechanical arthritis will be added to those of rheumatoid arthritis. It is this factor which has caused so much of the confusion between rheumatoid arthritis and osteo-arthritis already mentioned. The changes typical of osteo-arthritis, which are so often seen in rheumatoid arthritis, are merely those of the mechanical arthritis which is an inevitable sequel to the damage caused to the joint by the rheumatoid disease.

In rheumatoid arthritis, however, the picture is altered by the presence of hyperæmia, which is such a constant feature of the active stage. Hyperæmia delays or prevents the onset of sclerosis of bone and so the degenerative changes predominate. When the articular cartilage has finally worn away, the hyperæmia may limit the condensation of the underlying bone, so that two soft cancellous bony surfaces come into contact. Since movement is restricted to a great extent by the stiffness of the joint actual bony union may then take place, particularly in joints, such as carpal or tarsal joints, where the normal range of movement is limited.

Later, when the disease becomes quiescent, the hyperæmia is replaced by anæmia, probably due in

part to the contraction of the fibrous tissue round the joint. At this stage sclerosis of the bone is likely to develop, with formation of osteophytes, provided that some degree of movement has been retained to provide the stimulus.

Gouty arthritis.—The effect of local anæmia in causing sclerosis of bone and a more proliferative type of arthritis explains the frequency with which these changes are found in elderly and in arterio-sclerotic patients. The products of disordered metabolism, such as are formed in gouty arthritis, damage the joints, and in some cases this is the primary cause of the subsequent osteo-arthritis. This form of arthritis also consists of two components: (1) the primary metabolic disorder with its local effects on the joint, and (2) the resulting mechanical arthritis. To these may be added a third factor—namely, anæmia of the tissues from the often associated arteriosclerosis. This factor tends to accelerate the deterioration of the joint and may increase the sclerosis of the ends of the bones.

Nutritional disturbances.—In many cases, especially in elderly subjects, no definite primary cause can be found for the osteo-arthritis. In such cases deterioration of the cartilage, which becomes soft and fibrillated, is usually the first change, and I suggest that this is probably due to deficient nutrition. In this sense such changes may reasonably be described as "trophic" and are probably a direct result of the often associated arteriosclerosis. Once such changes have taken place in the articular cartilage, the eventual onset of generalised osteo-arthritis becomes inevitable

(To be concluded)

GAS INJURIES TO THE EYES

THE damage to the eyes that may arise from high explosives and incendiary bombs will not differ essentially from that met with in peace-time practice, and its treatment can be based on established principles, but injuries due to gas are largely an unknown quantity.

Though the value of gas as a measure of offence in comparison with high explosives is open to doubt, and therefore the extent to which it will be used in this war remains to be seen, the possibility that it will later be employed to produce panic and disorganisation among civilians must be prepared for.

The experience gained in the last war, however, may not be applicable to this, not so much because new unknown gases may be used but because the methods of distribution of gases are now more effective.

Almost all gases used in chemical warfare cause some ocular discomfort and lacrimation, but the groups known as lacrimators and vesicants are of special significance. The lacrimators produce severe subjective symptoms, which are mainly ocular but also include burning sensations in the throat and pain and discomfort in the chest when patients are exposed to relatively high concentrations. The eye symptoms are outstanding—they consist of a stinging in the eyes, immediate and profuse lacrimation, and spasm of the eyelids, sometimes so severe that the victim is unable to open his eyes at all. These symptoms, though alarming, are transient, and within a few hours the whole condition subsides, leaving no permanent after-effects.

As against these dramatic and obvious effects of the lacrimators, the action of the vesicants is insidious This group comprises mustard gas and the allied Lewisite, the latter, though first prepared in 1917, has not as yet been used in war. When the eye is exposed to mustard gas there is a latent period whose duration depends on the concentration of the gas. In the last war it was, as a rule, six to eight hours, though sometimes it was as short as two hours, and it is absent when gas in its liquid form splashes directly into the eyes. After the latent period pain and a feeling of grittiness under the lids develop, followed by photophobia, blepharospasm and profuse lacrimation. The lids become œdematous and glued together. The conjunctiva, particularly in the interpalpebral area, is intensely engorged and swollen Where the cornea is involved, the photophobia and blepharospasm are more severe, and the patient may think himself blind because he cannot open his eyes. There is no purulent discharge unless secondary infection takes place In cases of corneal involvement the part of the cornea that is covered by the upper lid is usually unaffected. The exposed interpalpebral area loses its lustre, a turbid horizontal band is thus seen stretching across the clear cornea to become confluent with the affected interpalpebral conjunctiva. The pupil is contracted. Abrasion, ulceration and secondary infection may all occur, rendering the immediate prognosis more grave. Where there has been a direct splash with liquid gas intense lacrimation sets in within a few minutes; within half an hour there is great injection of the conjunctiva and within an hour progressive chemosis Infiltrating ulceration involving the cornea, conjunctiva and lids develops The corneal lesion is similar to that of any severe caustic burn, but the slowly progressive damage and delayed healing more resemble an X-ray burn

During the last war only about 10 per cent of gassed men developed corneal lesions—mostly transient—and it is said that only about 15 men in all were blinded by gas This figure is almost certainly an underestimate, if the cases of late keratitis, not recognised till several years after the war, are included. None the less, the figures do help us to place the risks of mustard gas to the eyes in their proper perspective, for protective measures against gas have developed considerably in the last twenty years.

TREATMENT

Fundamental difficulties arise in treatment Experimental works by Warthin and Weller[1] on various animals suggests that the action of gas is instantaneous. If drops of liquid mustard gas are put on both corneas of an animal, and one eye is at once thoroughly irrigated, the lesions in the two eyes on the following day are identical Histologically all the layers of the cornea are involved, and in severe cases the whole of the cornea is necrosed, exposing Bowman's membrane If these findings are applicable to man, the end-result will be determined almost entirely by the concentration of the gas reaching the eye, and treatment can only be directed to relieving symptoms and combating the cumulative action of the gas This lamentable view, which is generally accepted, is contested by Bonnefon,[2] who points out that horses were more affected than men by gas during the last war, and records the severe

1. Warthin, A. S., and Weller, C. V., Medical Aspects of Mustard Gas Poisoning, St. Louis, 1919.
2. Bonnefon, *Gaz. scien. méd. Bordeaux*, March 12, 1939, and *Siècle méd.* Sept. 1, 1939.

course of eye lesions in animals as the result of the absence of lacrimal secretion with its defensive mechanism As against the classical treatment—irrigation with some bland lotion such as sodium bicarbonate solution, instillation of castor oil or liquid paraffin, and atropine drops where necessary—Bonnefon advocates measures to increase the flow of tears and induce drainage from the conjunctiva and cornea by osmosis He regards oily drops as harmful because they absorb the gas and thus keep it pent up in the eye, ointments he condemns for the same reason and also because they impede the flow of tears by glueing the lids together He suggests irrigation for 10 minutes, two or three times a day, with a hypertonic lotion such as saturated solution of sodium sulphate 800 grammes, solution of glucose 200 g

One other method of treating severe corneal lesions may perhaps be found applicable Of late years Denig has proposed immediate mucous grafting of the cornea in severe caustic burns, the graft being taken from the mucosa of the lower lip The results are said to be gratifying, and this method may be worth trying out in exceptional cases

In all degrees of eye lesions from mustard gas two symptoms require special attention, as was urged by Sorsby at the Aberdeen meeting of the British Medical Association The blepharospasm induces a fear of blindness with a severe anxiety state By gently separating the lids the patient can be convinced of the groundlessness of fears The pain that patients experience has led to the suggestion that cocaine drops should be instilled, but most authorities agree that cocaine should be avoided owing to its devitalising effect on the corneal epithelium Substitutes such as Pantocaine and Larocaine have also been recommended,[3] and Dor[4] advocates 2 per cent dionin drops Where pain is severe, atropine is generally indicated because of the associated corneal lesion, and this should usually suffice

GENERAL POST

MOVEMENT OF THE MEDICAL SCHOOLS

DETAILS of the arrangements for the future of medical education in London and the provinces have now been worked out by most medical schools. In general, it may be said that preclinical teaching in London is to stop, the London students being transferred to various provincial universities The clinical teaching of the London schools, on the other hand, is to continue in the hospitals of the sector of each teaching hospital The provincial schools are staying where they are, though many of them will have to make changes in organisation to cope with the London evacuees In most cases these newcomers are bringing their own teachers with them, and the students will continue to take London examinations The arrangements for clinical teaching in hospital sectors vary as yet in completeness The most usual plan appears to be to dispatch those needing elementary clinical instruction to the base hospital, while the other students are divided into small groups that will move from hospital to hospital At certain hospitals usually those accommodating the sector pathological laboratories arrangements will be made for teaching practical pathology and as a rule one or two hospitals in each sector have adequate facilities for midwifery

Groups of students will be on duty at casualty clearing stations for short spells

The system will offer certain great advantages The amount of clinical material and the opportunities for practical experience will be enormously increased, and this should more than compensate for the dispersal of clinical teachers Many students will for the first time realise that municipal hospitals are not to be despised, and that there are many whole-time doctors in municipal service who can hold their own at the bedside with their voluntary-hospital colleagues In some of the smaller hospitals, general-practitioner members of the staff are already doing their share of teaching, and the students are learning at first hand that general practice is not the occupation of the second-rate doctor The position of the clinical students will be reviewed by the deans of the London hospitals towards the end of the year

The arrangements for the London medical schools will be reviewed by their deans towards the end of the year, at present they are as follows —

St Bartholomew's.—The preclinical anatomy and physiology will be carried on at Cambridge, while clinical studies will go on at St Bartholomew's casualty clearing station and the other hospitals in sector 3 Teaching in first year subjects has yet to be arranged

Charing Cross.—Preclinical students for Charing Cross Hospital normally attend King's College They will follow King's College to Glasgow University Clinical students will be distributed throughout the hospitals of sector 4 Teams of surgical dressers and blood-transfusion groups have been arranged Clinical beginners are likely to be posted to the base hospital and an interchange of students between the hospitals to vary clinical experience will probably be organised The address of the secretary of the Medical School is 81, St. Margaret's Road, Twickenham, Middlesex (Tel : Popesgrove 1226)

St George's.—Preclinical students who normally study at King's College will be transferred with that college Clinical students are dispersed throughout sector 7 About 25 are at Isleworth, 15 at Staines, 10 at Slough, and smaller numbers at various L C C hospitals

Guy's.—The preclinical students at Guy's will not go to Oxford as previously announced but to Sherwood Park, near Tunbridge Wells Students will be lodged in private houses converted into hostels Clinical students are distributed to the hospitals throughout sector 10

King's College Hospital.—The preclinical students at King's College will go to Glasgow University The clinical students have been distributed through the hospitals in sector 9

The London.—Preclinical students are to go to Cambridge They are being provided with board and lodging at St. Catherine's College, but their teaching arrangements are in the hands of their own professors and not the university staff Clinical students are distributed throughout the hospitals of sectors 1 and 2 Subject to the approval of the county borough councils concerned, teaching will be carried on in the municipal hospitals at Romford, Rochford, and Whipps Cross, and in many voluntary hospitals including Southend General, Queen Mary's at Stratford, and the King George V Hospital at Ilford In sector 2 there are 12 large L C C hospitals and also two important Middlesex county council hospitals A service of dressers at casualty hospitals in dangerous areas will be maintained and students will take turns for short spells on duty at these casualty hospitals Facilities for teaching obstetrics will probably be available at the Hackney and Mile End Hospitals of the L C C, at Oldchurch County Hospital, Romford, and at Brockett Hall which is being opened as an obstetric hospital for the county of Hertfordshire Courses in pathology will be organised at Billericay Hospital under Professor Bedson, pathologist to

3 Stallard, H B, *Lancet* Sept 2 1939 p 516
4 Dor quoted in *Pr méd* July 5 1939, p 1066

sector 1, and at Chase Farm P.A.I., Enfield, under Dr. Panton, pathologist to sector 2. The secretary of the medical school should be addressed c/o St Catherine's College, Cambridge, and the dean can usually be seen there on Sunday mornings at 11 A.M. Letters for the dean should go to the headquarters of sector 1, emergency hospital organisation, Essex County Hospital, Hermon Hill, Wanstead, London, E.11.

London Hospital Dental School.—The headquarters of this school will be established at Claybury Mental Hospital, Woodford Bridge, Essex. Subsidiary centres for clinical dental teaching will be opened at St. Margaret's Hospital, Epping, Haymeads Institution, Bishop's Stortford, St. Andrew's Hospital, Billericay, and probably also at Chelmsford P.A.I. and the Chase Farm. P.A.I.

St Mary's.—Preclinical students are to work at Manchester University. Clinical students will be distributed throughout the hospitals of sector 6.

Middlesex.—Preclinical students will be moved to the University of Bristol where they will continue under their own Middlesex teachers. Clinical students will be distributed throughout the hospitals of sector 5. Some will be at the Middlesex Hospital C.C.S. itself, others at the Mount Vernon Hospital, the Royal Bucks Hospital, Aylesbury, the Ministry of Health Emergency Hospital at Aylesbury, the Willesden General Hospital, and so on.

Royal Free.—Students working for the first medical examination are to go to St. Andrews University. Those working for the second M.B. are to go to Aberdeen University. Clinical students will work at the hospitals in sector 3, some continuing at the Royal Free C.C.S., while others will be at the base hospital at Arlesey in Bedfordshire.

St. Thomas's.—Preclinical students are to move to Oxford, while clinical students are to be distributed among the hospitals of sector 8.

University College.—The students of this college have been moved en masse to the University of Wales, Aberystwyth. The women preclinical medical students are, however, to go to Sheffield.

University College Hospital.—The clinical students are distributed through the hospitals of sector 4. Arrangements have already been made for clinical teaching at the West Herts Hospital, Hemel Hempstead, and at the Leavesden Hospital. A nucleus remain behind at University College C.C.S.

Westminster.—Preclinical students at King's College will follow that college to Glasgow. Clinical students will be distributed throughout the hospitals of sector 7.

University of London.—The administrative offices of the university are now located at the Royal Holloway College, Englefield Green.

British Postgraduate Medical School.—Postgraduate teaching has practically ceased, but 27 undergraduate students are attached to the Hammersmith Hospital, in connexion with the E.M.S. scheme. These are receiving clinical instruction in medicine, surgery, midwifery and pathology, on the 300 civil sick occupying some of the 700 beds of the hospital.

PROVINCIAL MEDICAL SCHOOLS

In general it may be said that the provincial medical schools are acting entirely as evacuation areas. Newcastle-upon-Tyne, being a de-restricted area for air-raids, is not receiving evacuees. At Oxford it is probable that a complete clinical course for Oxford students will be organised at the Radcliffe. Teaching in most areas will probably begin earlier in the day and end earlier so that blackout difficulties may be avoided. At Newcastle work is to cease at 3.30. Many provincial schools have already been depleted as members of their staff have left for service appointments, but clinical teaching will not be seriously affected.

ORGANISATION OF A SECTOR

THE Government's scheme for the reorganisation of hospitals to be ready for civilian air-raid casualties has undergone modifications in detail since it was announced in March, but few changes have been needed in its framework. A year ago the Minister of Health divided England and Wales into twelve regions, each with a "hospital officer," usually a member of the Ministry's medical staff. This officer drew up a plan for placing the hospitals in his region on a war basis, and when war came he was responsible for putting it into effect. The general aim was to provide in the danger areas for the collection, first-aid attention and sorting of casualties, and for enough treatment at casualty-receiving hospitals to fit them for a journey by ambulance. Next, to provide advanced base hospitals in presumably safer areas, fully equipped in both apparatus and personnel to carry out all necessary operative or other treatment of the injured; base hospitals still further from danger to which patients could be moved for after-treatment; and, finally, a group of less well-equipped hospitals for convalescent and chronic cases. London formed one region, but on account of its dense population and liability to attack it required special consideration. The Metropolitan Police district and the area within about forty miles was therefore divided into ten sectors, radiating out from the twelve big London teaching hospitals, which were to be the main casualty-receiving hospitals for their sectors. Each of these teaching hospitals nominated one of its staff, often the dean of the medical school, as "group officer." His task was to allocate the work of the hospitals and personnel in coöperation with the hospital officers into whose regions his sector extended, and under the supervision of the Director-General of the Emergency Medical Service. He was not responsible, however, for the internal management of the hospitals, which remained in the hands of the governing boards or the local authority, as the case might be.

Sector V. makes a convenient example of the organisation, being one of the smallest. Its parent hospital and main casualty-receiving hospital is the Middlesex, and its group officer, Dr. H. E. A. Boldero, has his headquarters and secretarial staff in a private house at Rickmansworth. The number of available beds at the Middlesex has been reduced from the pre-war 614 to 320, and the medical staff now consists of 21 full-time men, mostly drawn from the junior members of the ordinary staff, and 40 students in their clinical years. In the first few days of the war the hospital was cleared of patients as far as possible by sending them home or to other hospitals, and for the first fortnight only urgent cases were admitted. At that time only 78 patients remained. Since Sept. 16, however, the Minister of Health has sanctioned the admission of semi-urgent cases from the waiting list. Windows, sky-lights and so on have been protected, but no great structural alterations have been needed to convert the buildings to their new purpose.

The sector contains seven other casualty-receiving hospitals "class 1A"—that is to say, hospitals of over 50 beds which were or have been made capable of giving the necessary immediate treatment to casualties—namely, the Central Middlesex, Harrow general, Wembley general, St. Andrew's Dollis Hill, Willesden general and Willesden infectious diseases hospitals. In most of these the number of beds remains about the same as before the war, though in some additions are projected. The buildings have

been given protection from air attack and additional equipment has been supplied by the Ministry of Health Their medical staff are not all full time, some being still in practice in the neighbourhood The Willesden general, for instance, has 6 full time and 4 part time men and 14 Middlesex students, the Harrow general 5 full time men living out, 2 resident house officers, 6 part time men and 12 students These hospitals have also been cleared of patients except for a nucleus of about a fifth of their complement In addition there are five casualty-clearing hospitals "class 1B"—Paddington Green, the Western Ophthalmic, the Samaritan Free, the Radium Institute, and Northwood and Pinner hospital—special or small hospitals that will only change over from their ordinary work to the reception of casualties when the organisation is hard pressed

Next come the two advanced base hospitals, the Mount Vernon and the Royal Bucks at Aylesbury The Mount Vernon has been greatly enlarged and is now equipped and staffed to deal with all kinds of injuries Before the war it contained 100 beds for cancer patients, now it has 520, 300 being in tents on the lawn, and when its hutted annexe is finished it will have 620 It has an entirely full-time staff of 29 as well as 24 students, mostly drawn from the Middlesex The Royal Bucks has had some 35 beds added to its pre-war 115, and also has some students attached The casualty receiving hospitals will send their patients when they are fit to move to one of these two, the intention being that the Mount Vernon will take patients from the Middlesex and its neighbourhood and the Royal Bucks from hospitals further out, though this must necessarily depend on where the main brunt of an air-raid falls

In most sectors the base is situated well away from London and arrangements have been made for the reception there of a large number of patients At Arlesley, for example, the base hospital for sector III, the Three Counties mental hospital has been extended to take 1200 casualties in addition to its 1100 mental patients Similarly, the base for sectors VIII and IX at Horton will have over 2500 beds In sector V, however, no comparable institution capable of rapid conversion was available, and the base is placed at Aylesbury close to the advanced base hospital For this purpose the Aylesbury public assistance institution is being enlarged and up graded by the erection of tents and huts and the addition of theatre and other equipment to hold some 700 patients The three remaining hospitals in sector V—Chesham cottage hospital, St Monica's children's hospital and the London lock hospital—may be needed later for the reception of chronic or convalescent cases Meanwhile, like the casualty receiving hospitals in class IB, they will go on with their ordinary work.

PANEL AND CONTRACT PRACTICE

Regulations Suspended

THE Ministry of Health have informed insurance committees that the regional medical service has been suspended and the regional medical officers assigned to other duties Insurance practitioners cannot, therefore, now refer cases to the R M O either to assess incapacity for work or for consultation Other activities under the medical benefit regulations which have been suspended until further notice are

(*a*) The routine testing of drugs and appliances supplied to insured persons Special tests may, however, be made where there are good grounds for thinking that tests are desirable, (*b*) Proceedings under regulation 43 for alleged excessive prescribing, (*c*) Proceedings under regulation 41 for the investigation of certification, (*d*) Proceedings under regulations 42 and 45 for failure to keep medical records The Ministry are not enforcing the obligation to keep records during the war, but are leaving practitioners to keep such records (especially clinical notes) as they can in the pressure under which they will be working It has been suggested that where the absentee practitioners' records are deposited with insurance committees they should be redistributed among the acting practitioners who have these patients on their temporary lists, for their information and completion This course also seems desirable from the point of view of the safe keeping of the records to avoid their concentration longer than is necessary in the offices of committees, (*e*) Proceedings under regulations 47 and 48 for substances alleged not to be drugs or prescribed appliances, (*f*) The routine checking of prescriptions against practitioners' lists The committee, however, is given discretion to deal with a particular case

More Cooperation and Larger Lists

The Ministry have suggested that for the period of the emergency insurance practitioners should agree to forgo payment from the local practitioners' fund for emergency treatment and anæsthetics It has long been the policy of some panel committees to discourage claims for emergency treatment on the ground that practitioners should act for one another in case of necessity on the principle of give and take

In view of the smaller numbers of practitioners available for civilian (including insurance) medical service some latitude will be found necessary in the maximum number of insured persons permissible on practitioners' lists General approval has been given in allocation schemes for an additional 500 to the maxima prescribed for practitioners with and without partners or assistants, and a similar increase in the average for a partnership This relaxation will be examined in the light of experience and the extension now allowed may even be increased

Prescriptions and Certificates

The Minister has been approached about insurance practitioners' surgery hours and insurance chemists' shops' hours of opening, in view of the blackout Though early closing would be convenient to doctors and chemists, and even many patients, it must be remembered that national needs will not permit all works and offices to close before nightfall The Minister has recommended insurance committees to review the position in consultation with the local panel and pharmaceutical committees and make suggestions The Minister has also said that it would help if practitioners always make a practice of issuing prescriptions and certificates to patients at the time of visiting them It is a little surprising to find that the Minister has found it necessary to make this suggestion

Absentee Practitioners

Large numbers of insurance practitioners have been called away Some have arranged for partners or deputies to carry on their practices on their behalf, but many have taken advantage of the B M A. scheme for the protection of practices So far as insurance practice is concerned, 50 per cent of the

remuneration of the absentee practitioner is credited to him and the other 50 per cent., less an amount to be determined in respect of the cost of administration, forms a pool from which acting practitioners are remunerated for their services. The bureaus to administer this arrangement are as a rule the local insurance committees During a practitioner's absence his list will be reduced in respect of deaths, cessations from insurance and removals outside the area of his practice; the ordinary end-of-quarter transfers will also operate, but he will continue to be remunerated in respect of those of his patients who have placed themselves provisionally under the care of acting practitioners.

So far as acting practitioners are concerned, acceptances during the war will be provisional and afterwards all patients will be given the option of exercising a fresh choice. Insured persons accepted for the first time, that is to say, new entrants and removals into the district, will carry 100 per cent. capitation value to the accepting practitioner, but provisional acceptances of the patients of absentee practitioners will of course rank only towards the distribution of the bureau pool. Acting practitioners would be well advised, when accepting patients of absentee practitioners, to take care that part "B" of the medical card is completed and that the word "provisional" is endorsed in that part of the medical card as well as their signature Insurance committees in their capacity as local bureaus will have to keep a separate record of this type of provisional acceptance, and practitioners will find that a little extra trouble in indicating the type of acceptance will be amply repaid in reducing misunderstandings.

As already indicated, the keeping of medical records will not be obligatory during the war, but some bureaus are arranging to supply specially marked continuation cards for provisional acceptances of patients of absentee practitioners, so that the acting practitioner may readily recognise the war-time patient and make any clinical note he may feel desirable. Practitioners who are leaving their civil practices to take up national service are reminded that they must communicate with the insurance committee and indicate the nature of the arrangements made for the conduct of their insurance practice It is difficult to believe, but we are told that some practitioners have gone on full-time national service without making any arrangements to secure the treatment of the patients for whom they are responsible and for whom they are being paid by the insurance committee.

GRAINS AND SCRUPLES

FROM D P.M.

V

Now that we have leisure to exchange views, I am finding out how different people prepared for war. One friend of mine bought herself a pair of ski-ing trousers and some sherry, and another laid in an eighty-pound cheese. Some have bought bicycles and some bedsocks, and one unearthed a piece of crochet she had begun in her first year as a medical student. When I reviewed my own preparations, I found I had chosen a pair of gum-boots and a Chippendale chair.

Amateur philosophers, luckily for everybody, are nearly as common as amateur generals in war-time. It is an old observation that an ordered routine makes people disgruntled whereas a crisis mellows them. You have only to compare the savage conduct of the average man and woman catching a bus in the rush hour with the coöperative, gay and unselfish behaviour of the same people during a transport strike; their humanity is delightfully stimulated by a little misfortune The same genial atmosphere prevails in any large railway station on the eve of a public holiday, when trains loiter off irresponsibly, hours behind their time, and good-humoured passengers sit round upon their luggage cracking jokes. I suppose the truth is most of us welcome a change and are prepared to believe that provided things are different they might be worse. Still even philosophy can be carried to extremes—or so I thought after hearing two of our more tranquil critics discussing the situation the other day. The conversation ran as follows:

"Terrible business, their sinking this warship"
"Yes—well—but it's war, I mean, isn't it?"
"Yes; I suppose we mustn't grumble."

* * *

The trouble about golf, an enthusiast tells me, is that the clubs face the wrong way. I cannot understand the finer points of his sorrow, but he seemed to be complaining that all the real work has to be done by the left hand—and backhanded at that. Anybody but a fool, he says, would use his right hand for such a ridiculous stroke; and, following the example of the Oldest Member, tells this illustrative story A parsimonious acquaintance of his who decided to take up golf went round the junk shops pricing secondhand clubs; finally he found a complete set going for a song and quickly bought them—only to find, of course, that they were left-handed. But the annoying fellow, anxious to get his money's worth, decided to play left-handed; and found his golf much easier in consequence.

The unjust moral makes one wonder whether we are all more ambidextrous than we think. Left-handed people, of course, are commonly ambidextrous, no doubt because the general right-handedness forces them to conform to many right-handed actions In digging most people seem to be almost ambidextrous. I call it right-handed to hold the handle of the spade with the right and the shaft with the left hand; this means that you stand with the left foot advanced and use a right-handed drive and a left-handed lift Most men claim to prefer this stance, but add that they can readily use either hand. Women seem to favour the left-hand stance, perhaps because lifting is accomplished more readily with the right hand; on the other hand, left-handed people also seem to prefer the left-hand stance It seems curious but not very interesting.

* * *

Psychologists have done us all a service by insisting that an adult state of mind is proper to adult people. That this notion was summed up long ago in the phrase "Ripeness is all" is no fault of theirs We know well enough by now that nothing new is to be found in the human mind, and they have done their part in bringing the idea once more to our notice Moreover, they have reminded us that the mature state is becoming to every grown person—to women as well as men.

Of course, one may argue, a mature state is not accessible to mankind. Human intelligence is strictly

limited, battering blindly against concepts which tower beyond its scope We shall never get the hang of the cosmos with the rudimentary brain at our disposal—a brain which cannot contemplate space or eternity with any sense of meaning Evolution will have to do better than this before some creature can lay claim to maturity in an absolute sense We can, however, become mature in a relative sense as mature as our natural equipment will suffer us to be, just like any other animal I have heard it suggested that this degree of maturity is insufficient for our needs, that we are not, for example, and never can be, mature enough to avoid war because our limited intelligence will never find another way out of a deadlock Without sharing this defeatist view entirely, I do believe that until we can think of a way to prevent wars we deserve them, stupidity is always punished by nature, and I can see no reason why we should be spared

If we are not mature enough intellectually to prevent war, we can at least try to be mature enough emotionally to put up with it, and, taken by and large, I think we are For this reason I am sickened by the phrase "Women and children first" Why women? Surely maturity implies the fortitude to bear one's lot, and the mature woman should be as capable of that as the mature man Let us, indeed, distinguish between grown people and children Children first, by all means, children are growing creatures and therefore vulnerable But let us finally get rid of this morbid notion that women should be classed with them as something incomplete, brittle, meet to be protected Women in England are fortunate in having emerged from the long exhausting battle for an equal share in responsibility with men, they are able to grow to their full mental stature in responsive surroundings When responsibility is increased by war they cannot be expected to regress to a state of semi dependence, or to accept a greater share of protection than others merely in virtue of their sex Posters showing a terrified woman clasping a child and cowering behind a square shouldered male are an insult to us all It seems to me far less justifiable to send youths of eighteen or twenty into active service than to kill grown women with bombs

* * *

Grain without Scruple "For every new public law they put upon me I propose to take off one private one"—Medical Officer, exasperated by the black out

LETTERS TO THE EDITOR

CONFLICTING EMOTIONS

SIR,—I have little doubt that many of my colleagues who are honorary members of hospital staffs in London read your leading article last week with the same conflicting emotions it produced in me You appear to share the easy optimism of the nameless correspondent you cite and ask us to accept with you as inevitable consequences of the present emergency a virtual paralysis of civilian hospital services, and a total inactivity and an early bankruptcy of the hospital staffs Offered to us as adequately offsetting this wreck of our work and our fortunes are the speculation that had massive air raid casualties ensued upon the outbreak of war we should now be hailing the emergency medical scheme as a triumph of organisation, and the consolation that our bankruptcy will not be discreditable

One would need to be of a more than German docility to accept these astonishing propositions If it be true that something more than bedsteads buildings, doctors and nurses are needed to provide an effective hospital service, we may be allowed to doubt whether, had heavy casualties occurred a fortnight ago, we should now be congratulating ourselves upon any triumph of organisation Robbing Peter to pay Paul can hardly be called organisation, and this is the essence of the scheme to which we are committed

Yet the method has it must in fairness be admitted, a good precedent Readers of Charles Lamb's "Dissertation upon Roast Pig" will recall how those eager organisers Bo he and Ho ti burned down their house to roast a pig, and it seems that the ordinary medical needs of the population have been quite effectively burned down to roast the emergency pig Nor does the parallel end here for as in that engaging fable the insurance companies were forced to "shut up shop" by this method of organisation, so now—as you so cheerily assure us—the hospital staffs must expect to follow their example in no long time

I cannot believe that some plan for meeting the special needs of the emergency and at the same time taking some account of the ordinary needs of the community is beyond human ingenuity if only it were attempted, and I reject your correspondent's easy acceptance of the present state of affairs as embodying "the long view" Indeed, there are grounds stated in the latter part of your article that justify profound dissatisfaction with the present chaotic position of medical affairs

I am, Sir, yours faithfully,

Sept. 25 ANOTHER CORRESPONDENT.

SIR,—I have read with appreciation the leading articles in your last issue, entitled The Hospital Services, Medical Libraries in War-time, and Safety First Although apparently dealing with different subjects, they all bear the same message—namely, that in spite of the disorganising effect of war, the civil life of the community, and incidentally of the medical profession, must still contrive to carry on

It is inevitable that in the hurry to meet the requirements of war the everyday needs of the population should have been neglected, but, you rightly point out, a breathing space has been provided during which we can look around and contrive how this neglect can best be rectified

The last few weeks have seen the consultants of the London area sitting idle in their lodgings, or, if fortunate enough to be still in London feeding the ducks in Regent's Park, while patients badly in need of attention were at their wits end to know where to turn for help Now, in the hope of avoiding this, the Ministry is about to substitute for whole-time service some form of half time service, and the consultants are at present wondering whether it is better to continue in the Park or their lodgings or else to accept a wage on which—considering their obligations—it is absolutely impossible to live, in the hope that eventually they will succeed in resurrecting some modicum of private practice

The answer whether it is better to be content with a certain half loaf or to accept an inadequate bite with the chance of earning a substantial piece of cake depends of course on the ability or inability of the civil population of London, including of course ourselves, to adjust to present conditions If nursing homes are to remain closed, libraries shut, radium buried, theatres locked up, business transferred to the country, and civil life generally at a standstill, it will

be better to continue reading our papers in our lodgings, or feeding the ducks in Regent's Park. If, however, civil life is revived, and if consultants display a readiness to adjust to new conditions, to make long journeys at reduced fees, to operate in country nursing-homes without charging mileage, and to coöperate in every way possible with those to whom is now chiefly entrusted the medical care of the civil community, then the wastage of public money and of private time that the last two weeks have witnessed can be avoided

"We've *got to be prepared*" it is true, but prepared not only for war but also for the ordinary business of living For two years during the last war I lived an exceedingly happy life in the pleasant city of Arras. Although the line was less than a mile away, and although at night machine-gun bullets could be heard spattering on the houses, civil life still continued, so that calling in at the chemist's shop in the main street I was able to purchase a tube of chinese-white paint of which, as an amateur artist, I had happened to run short Surely the spirit of the civilian population of Arras is the spirit that is required in order to win a long war

I am, Sir, yours faithfully,

Harley Street, W., Sept. 25. KENNETH WALKER.

AIR-RAID PRECAUTIONS

SIR,—With reference to D P M 's article in THE LANCET of Sept. 23, he seems to have forgotten that shells and bombs *can* produce wounds as bad as any of those he humorously refers to The Poles are not finding the lack of precautions against air-raids even in outlying districts particularly funny just now; what is there to justify the sneers of D. P. M and his Spanish girl friend? Did Guernica enjoy the bombs? Was the Spanish civil war such a picnic? Are the 200,000 beds awaiting air-raid casualties just another sign of our fussiness?

I am, Sir, yours faithfully,

Folkestone, Sept. 24. G. F. JONES.

FATAL AGRANULOCYTOSIS

SIR,—The admirable account by Mr. Nicol and Dr. Freedman in your issue of Sept 16, of a fatality following administration of M. & B. 693, is a valuable addition to the medical literature on agranulocytosis It is of particular interest in being the first recorded case of death from agranulocytosis in a patient receiving the drug for the treatment of gonorrhœa. The patient was elderly (60) and well above the average age of cases of gonorrhœa, but in the absence of liver and kidney dysfunction advanced age has not hitherto been regarded as an indication for reduced dosage. In this case, the dosage used was high and prolonged, but no more than has been used for many cases that showed no serious signs of intolerance

The manufacturers of M. & B. 693, in a brochure on its use in genito-urinary infections, state:

"Transient reduction in granulocytes is a not infrequent phenomenon in patients undergoing treatment by drugs of this group; but with the amounts of the drug used in the treatment of gonorrhœa damage to the hæmopoietic system is unlikely. It has, however, been reported in a few cases treated with M. & B 693 for gonorrhœa, but in each case the dosage has been in excess of 30 grammes, a total considered more than sufficient by many observers.

"It is probably a counsel of perfection to suggest that repeated differential white cell counts should be a matter of routine in all cases receiving sulphonamide drugs, and even with frequent blood counts it has not been proved that this will prevent deaths from agranulocytosis. Possibly the surest method of reducing the risk of such a rare but dangerous form of intolerance will be to limit the length of time over which the drug is given to an optimal minimum not yet determined. . . ."

It would be of value if venereologists could pool their experience and arrive at an agreement as to what constitutes the most effective daily dosage and optimal minimum period of treatment

I am, Sir, yours faithfully,

ROBERT FORGAN.

Pharmaceutical Specialties (May & Baker) Ltd, Dagenham, Sept 22nd.

PREVENTING VACCINATION SEQUELÆ

SIR,—Dr. Jameson may be right in advising the application of potassium-permanganate compresses to vaccinal lesions on the sixth day. But one may question the statement that "by experiment it has been shown that if a subject be vaccinated daily, on the fourth or fifth day the vaccination ceases to take; also if the vaccination area be excised on the fifth day, subsequent vaccination does not take." Cory[1] found daily vaccination successful up to the ninth day. He vaccinated a supernumerary digit, amputated it on the fifth day, and successfully revaccinated the child a month later. He pointed out the precocity and acceleration of revaccinations; his observations were confirmed by Pirquet's investigations of allergy.

It would seem to be misleading to say that "vaccinal immunity is therefore established on the fourth or fifth day," unless experiments with modern lymph have invalidated the older work. Dr. Jameson may nevertheless be right in his opinion that "nothing is lost by disinfection of the vaccinal area on the sixth day," as clinical and experimental evidence suggests that the virus is frequently generalised throughout the body at that time.

I am, Sir, yours faithfully,

PHILIP EVANS.

King's College Hospital, S E 5, Sept 23.

TOWN AND COUNTRY NITS

SIR,—Your issue of Sept. 16 gives (p. 674) the percentage of verminous children in some South Country schools. A month ago the rural schools in the North Riding of Yorkshire were nearly 100 per cent. clean Whatever the percentage may have been at Gateshead and Leeds, they must have inadvertently selected that percentage to send as evacuees into our district The children were nearly *all* verminous. The horror of the hostesses of these children, whether in cottage, vicarage or big house, was indescribable. Tooth combs and Derbac soap were sold out in Northallerton before the end of the week; the only subject of conversation on market-day was the best methods of delousing. The babies and toddlers were in the same state, and what shocked the country folk more than all was the supine attitude of the evacuated mothers towards the pest. Doubtless they were in the same state themselves. We shall send the school-children back to their parents clean (and with, I hope, improved health and table manners), and when the war is over and we can turn our attention to setting our own house in order, cannot a campaign be set in motion to civilise our own towns A terrible state of affairs has been revealed by the manners and customs as well as the dirty condition and habits of many of our evacuees

I am, Sir, yours faithfully,

PHYLLIS M. JOHNSON.

Mount Grace Priory, Northallerton, Sept 24.

1. Cory, R, Lectures on the Theory and Practice of Vaccination. London, 1898, p. 48

THE BURDEN NEUROLOGICAL INSTITUTE

SIR,—In view of the difficulty that must be experienced in obtaining inpatient treatment for cases of nervous and early mental disease occurring in evacuation areas I should be glad if you could bring the services offered by the Burden Neurological Institute to the notice of your readers The institute would be prepared to receive a number of cases of early mental disease for a course of shock therapy, and cases of organic nervous disease including cerebral tumours for investigation and if necessary operation The institute which was endowed by the late Mrs Burden is fully equipped both for neurosurgery, shock treatment and endocrinological investigation

I am, Sir, yours faithfully,

F GOLLA

Stoke Lane, Stapleton, Bristol, Sept 23

LONDON VOLUNTARY HOSPITALS EMERGENCY BED SERVICE

SIR,—On the outbreak of war, by a prearranged plan the whole staff of this service was taken over by the Ministry of Health as part of the Ministry's emergency medical service to assist in running the sector casualty bureaus In consequence, the emergency bed service was closed down A new staff has now been recruited and the service will reopen forthwith and will endeavour to assist doctors to obtain admission for their acute or emergency patients In the first instance it will only be possible to run a daytime service (9 A.M. to 10 P.M.), but it is hoped to restart the full 24 hour service *as soon as* the staff are sufficiently trained

I am, Sir, *yours faithfully*,

R E PEERS,

Secretary, Joint Committee of the King's Fund and the Voluntary Hospitals Committee

10, Old Jewry, E.C.2
Sept 25

PUBLIC HEALTH

Obstetric Appointments in Receiving Areas

In a letter addressed to medical officers of health in the receiving areas on Aug 25, Sir Arthur MacNalty made it clear that the arrangements for the care of expectant mothers evacuated to their areas were the responsibility of the local supervising authorities The maternity work involved, he said, should be under the clinical supervision of an obstetric specialist or specialists, who should be in charge of the maternity unit for complicated cases These specialists should also act as consultants for antenatal cases of doubt or difficulty, in the treatment of women suffering from serious illnesses of pregnancy, in complicated confinements and in the treatment of *puerperal sepsis* He suggested too that one or more medical officers with sound obstetric experience might be needed to act as residents in the larger improvised maternity homes and to assist the specialist in other directions The local emergency committees of the British Medical Association were to be consulted on the matter of personnel and if obstetric consultants of suitable standing were already employed by the authority, their services should be utilised for this work Local authorities have had time to consider their needs, and the Minister has now asked for their proposals

The officers will be appointed and paid by the local authority, the salary scales being based on those of the Emergency Hospital Medical Service Whole-time obstetric specialists (non resident) will be paid £1300 a year, the salary of a group officer Part-time specialists will be paid a proportion of that salary Obstetric officers who act as residents either at the hospital unit for complicated maternity cases or at an improvised maternity home will be paid £550 a year, the salary of a medical officer under the emergency hospital scheme In some cases two or more authorities may combine and make a joint appointment, or the officer's time may be divided between surgical and obstetrical work The appointments will be for six months in the first instance A number of them have already been made

Hospital Treatment for Non-Casualties

The Minister of Health has taken further steps to make it generally known amongst the hospitals that patients whose medical condition necessitates inpatient treatment should be immediately admitted. This "reflux" into the normal hospital accommodation was always provided for in the Ministry's scheme. To meet it, new beds are continually being added, so that on balance the number held in reserve for casualties will not be seriously diminished The figures received by the Ministry each day from the regional hospital officers show that this is in fact taking place Outpatient departments are continuing to function and are being reopened at a number of hospitals where they had been temporarily closed

EPSOM SALTS

MANY observers have studied the cathartic action of $MgSO_4$ on the bowel, but several of its features have remained obscure Clearly the salt, whether in dilute or concentrated solution, induces hypermotility of the gastro-intestinal tract, and it is also known that it causes secretion, but it is not certain whether secretion alone is responsible for the increased bulk or whether transudation also plays a part In experiments on cats, Lium and Florey noted[1] that a single dose of magnesium sulphate even in isotonic solution, might cause not only one watery motion but a continuance of such motions for some days and after the magnesium has been excreted A similar effect in man has also been noticed, and is attributed to a slowing of the absorptive capacity of the bowel Another possibility, that the prolonged action is due to irritation of the intestinal mucosa, was explored histologically by Lium and Florey, but they found no more evidence of irritation with magnesium sulphate than with sodium chloride, although the appearances were consistent with secretory activity They also tried to determine the action of the magnesium and ordinary salts on defæcation in cats Magnesium-sulphate solution, in quantity comparable to that which causes purgation when given orally, was injected into the colon through an appendicostomy opening and the result was a defæcation attributed to the mechanical action of the increased bulk of the intestinal contents Sodium chloride had no such effect It was observed also that isotonic magnesium sulphate slowed the absorption of isotonic sodium chloride from the intestine, but did not influence the absorption of glucose solution

The poisonous effect of magnesium sulphate is described by F. E. Byron, who reports[2] five cases in which Tamil children, aged 2½ to 5 years, died within two hours of single doses of this drug

1 Lium, R., and Florey, H. W., *Quart. J. exp. Physiol.* August, 1939, p 303

2 Byron, F. E. *J. Malaya Branch, Brit. med. Ass.* June, 1939, p 109

OBITUARY

SIGMUND FREUD

M.D., LL.D., F.R.S.

Professor FREUD died on Sept. 23 at his son's home in Hampstead at the age of 83. He had been living in England for the last year since leaving Vienna after the Nazi coup d'état. Though psychoanalysis had been banned by National Socialism, Freud was kindly treated and allowed to bring with him his books and papers. A doctor by profession and a psychotherapist by occupation, he was essentially a scientist, with all the scientist's constant preoccupation with truth. To describe him as a philosopher is wrong; he was an observer of the mind, piecing together his findings with infinite patience, always prepared to admit himself wrong and indeed frequently doing so, rather than an abstract seeker after the nature of good and evil trying to square himself with his environment. When National Socialism and Fascism are merely turgid pages in the world's history, Freud will still be honoured. He founded the science of psychopathology. He developed the technique of psycho-analysis for its investigation. If he became the centre of a controversy as violent as that surrounding Darwin and Huxley, he had one advantage which was denied to them. He knew the reason for his opponents' opposition and in it he found fresh confirmation for his own case. It has been wittily remarked that man's self-esteem has suffered three great blows. The first was when Galileo demonstrated that the earth was not the centre of the universe but merely a small planet revolving round the sun. The second was when Darwin announced that man, traditionally made in the image of his Creator, was a product of evolution from the supposedly lower beasts. And the third was when Freud showed that the final crowning of man's achievement, his infinitely adaptable and creative mind, was nothing more than a sublimation of the baser instincts.

Sigmund Freud was born at Freiburg in Moravia on May 6, 1856. He was a brilliant youth, at the top of his class at the Vienna Gymnasium for seven years, enjoying special privileges. But both here and later at the university, no matter what his attainments, he found that as a Jew he was expected to regard himself as inferior. This he resolutely refused to do. His interest was a diffuse curiosity towards human concerns rather than a specific love of medicine, and it was the influence of Darwin's work and Goethe's nature studies which in the end determined his choice. Apart from psychiatry and neurology, medicine proper had no particular attraction for him and he was negligent in his studies. But he soon began to show an outstanding ability at research, first in the physiological laboratory and then the institute of cerebral anatomy. His first publications were monographs on aphasia and cerebral diplegia in childhood. But there was little scope for private practice in neuropathology and Freud quickly perceived that certain other aspects of nervous disease were entirely ignored in Vienna at that time, so he resolved to turn his attention to the neuroses. The treatment of these conditions was still a matter of crude empiricism. They were inaccessible to the physical methods of investigation by microscope and test-tube which were then yielding a rich harvest in the study of more obvious physical disease. To this attitude there was one important exception. Charcot at the Salpêtrière was studying the neuroses as a scientist. So in 1885 at the age of 29 Freud went to Paris. What he saw convinced him that hypnosis was something more than a smart trick or a fraudulent publicity stunt. In Charcot's hands hypnosis could induce artificial diseases which conformed exactly to conditions familiar in the hysteric. *Hysteria was no longer something* beyond the pale of scientific investigation; it conformed to laws, though these laws were not in a province familiar to doctors of the day.

On his return from Paris Freud married and settled down as a specialist in nervous diseases. But his new points of view and original methods of approach brought him immediately into difficulties with his colleagues. Opposition and ridicule greeted his *reports. The laboratory of cerebral anatomy* was closed to him; and finally he withdrew entirely from academic life. Left alone at the age of 30 with his private practice in nervous diseases, he soon discovered the uselessness of such fashionable remedies as electrotherapy and so set out in search of some method based upon scientific findings. At first he used hypnosis only as a positive instrument to give commands. In a joint investigation with a senior friend, Josef Breuer, *they made the remarkable discovery that a* hysterical patient under hypnosis was able to reveal the meaning of certain of her symptoms in terms of her past life. They found to their surprise that as these secrets were revealed so her condition improved. On the basis of this and some similar experiences a "cathartic" method was evolved, and in 1893 their book "Studien über Hysterie" was published. Four years previously Freud had attended Liebault's and Bernheim's *astonishing demonstrations in hypnotism* at Nancy and had there become convinced that powerful mental processes could exist which nevertheless remained hidden from the consciousness of man. In "Studien über Hysterie" the distinction between the conscious and the unconscious was stressed and the importance of the emotions in mental symptoms began to come to light. But differences between Freud's view and Breuer's were even then obvious. Freud *suspected an interplay of opposing forces in the mind,* while Breuer inclined to a more physiological conception.

In the next fifteen years, as a result of concentrated and almost completely isolated clinical work, Freud built up his system of psychopathology and psychoanalysis. Each step followed logically though at times setbacks occurred. He soon discovered that the suppressed emotions and memories which were unearthed by hypnosis were of an erotic or sexual nature. He found that in investigation of the neurotic patient, transference-love invariably developed between the patient and physician. He did not attribute this to his own attractions, nor like Breuer fly from it as a danger. He came to realise that transference represented a displacement of affect, that in these patients there was, as it were, a quantum

of labile emotion ready to attach itself to any convenient object

As his experience increased he found certain disadvantages in hypnosis as a technique Some patients refused to be hypnotised, while in others an unconscious resistance to recall was encountered Two steps followed The first was the recognition that forgetting and not knowing about past emotional experiences was a positive rather than a negative phenomenon Powerful forces were at work to exclude unpleasant realities from consciousness, so the theory of repression was born A neurosis was seen as an outlet for this suppressed emotional energy, an unsatisfactory and antisocial mental satisfaction The second step was the development of a technique which obviated the necessity for hypnosis This was called free association If a person speaks at random the first things which come into his mind, the choice is found not to be the random one, as one might expect, but rather to be determined by dynamic mental processes in the unconscious A prolonged series of interviews at which the patient speaks in this manner reveal to an astounding extent the mental processes and events which were emotionally significant in his past life The unearthing of these hidden traumata is the essential part of the technique of psycho analysis Although developed as a therapeutic method it is by no means always a practical procedure It requires a considerable amount of intelligence in the patient, not to mention an infinity of patience in both patient and doctor Further, therapeutic results are not invariably satisfactory For these reasons, apart altogether from the surprising and to many people unpleasant content of the unconscious, psycho analysis has met with much opposition Yet looked upon as a method of investigation of the unconscious mind all unbiased psychopathologists must admit its value

The work of searching for forgotten memories led over further back and slowly revealed the importance of children's sexual practices and their wishes and fantasies relating to sexual things At this point a dramatic crisis arose which threatened to overwhelm both the research and its author He constantly unearthed experiences of sexual seduction by adults in the childhood of his patients and to these he attributed a traumatic action in the cause of their neuroses But he was at last obliged to recognise that many of these were actually untrue in fact and figments of the imaginations of his patients This realisation seemed to undermine the whole of his work But he kept on He found that symptoms were undoubtedly associated with these episodes, though the episodes themselves were imaginary They were fantasies and wishes often interwoven with memories of real sexual acts and forgotten practices with other children Without knowing it Freud had stumbled here upon the Œdipus complex That the love of a child for a parent could be sexual was an epoch making discovery which perhaps more than any of his other findings aroused resistance among those who did not wish to see themselves as they really were

If the neuroses furnished the first clue to the existence of the unconscious mind three other lines of investigation provided ample confirmatory evidence In 1900 he issued his "Interpretation of Dreams" In it he showed that the apparently nonsensical nature of the average dream became a matter of commonsense simplicity if it was realised that the dream represented in symbols compatible with consciousness the sexual desires of the unconscious mind The work was met with indifference or laughter. He was not dismayed but asked himself why his readers laughed This led on to his studies of humour and wit Here again he found that the conscious defended itself from the unpleasant in the unconscious by treating it as a joke His conclusions were recorded in his book, entitled "Wit and its Relation to the Unconscious" The third investigation which helped to clarify the situation was that on the Psychopathology of Everyday Life, published in 1904 He observed that trivial events such as forgotten appointments, requests neglected, and even the random choice of figures, were actually determined by unconscious wishes or fears

From this time on his isolation came to an end A circle of pupils gathered round him in Vienna and he was encouraged by the interest of Bleuler and Jung at Zurich In 1908 the first informal congress meeting was held at Salzburg, but as psycho analysis became more widely known so opposition to it extended Then in 1909 he was invited to the United States to lecture at Clark University The event seemed to him like a day-dream In Europe he was despised, but "here psycho analysis was no product of delusion, but a valuable part of reality" Three years later Adler and Jung parted company from him Each singled out one feature of mental life and stressed it above all the rest Freud only insisted that they should both cease to describe their views as psychoanalysis During and after the war psycho analysis steadily gained ground If it attracted to its ranks some who by their mental instability were fit rather to be patients than prophets, it safeguarded itself by insisting that none should practise true Freudian analysis who had not themselves been fully analysed The vast body of knowledge of the unconscious mind which the host of workers in Europe and America have now built up is unfortunately all too often incomprehensible to any but the elect Psycho analysts have seldom followed their master in the expression of their views in simple everyday language The mysteries of the craft are hidden in polysyllabic jargon and the output of literature is more impressive quantitatively than qualitatively

But Freud's work still stands four-square The existence of the unconscious mind has been established beyond cavil The mental processes of repression, sublimation, transference, and symbolism are now commonplaces Whatever the ultimate judgment of psychiatrists on psycho analysis as a therapeutic technique, there can be no doubt that as an explanation of the symptomatology not only of hysteria and the anxiety and obsessional states, but also of schizophrenia, paranoia and depression, Freudian psychopathology is of fundamental importance What Virchow was to the body, so Freud has been to the mind The microscopist and the analyst fill in the gaps The structure itself is sound

AN INTIMATE IMPRESSION

A colleague writes. "When I knew Professor Freud in Vienna in 1922, he was aged 65 and more or less at the height of his career Soon after 1910 the solitary obscurity which had surrounded him and his work for something like 20 years had begun to lessen, while the war neuroses in Europe had generated, both in the medical profession and in the general public, an interest in the psychological approach to such disorders This had brought his work into the foreground and made his name known In 1922 he and his followers in Vienna Berlin and Budapest were fully occupied with teaching and training (first and foremost by analysing them personally) the group of English, American and Swiss physicians and others,

who were taking up the new study of psycho-analysis. A few years later, in 1924, the serious but successful operation on his jaw caused him ill health at times, though it affected only slightly his capacity for work and his speech. He afterwards went about even less than formerly, and the future will probably judge his later work as falling short in various ways of his earlier achievement.

"I had met Professor Freud at The Hague in 1920, at the first International Congress of Psycho-Analysis held after the war. He impressed one as an exceptional personality. His appearance was not typically that of a medical man, nor was it particularly Jewish. The long pale face with grey beard and stooping shoulders were those of an intellectual and might have suggested a learned professor, but for two other essential characteristics. There was his lean but broad and sturdy figure, the rather stern expression and firm jaw, which bespoke a great reserve of dignity and hidden strength—an indomitable tenacity. He appeared somewhat aloof, in fact he could easily be bored by crowds and gatherings. His most striking feature, however, was the forward thrust of his head and critical exploring gaze of his keenly piercing eyes. Finally, this rather awe-inspiring appearance was lightened by the glow of an enchanting humour, always latent and constantly irradiating his whole person as he spoke, which reassured one that the Olympian was indeed a mortal too. I knew already from his writings of his astonishing knowledge of literature, of his memory, especially for Shakespeare; and of his other tastes, his love of all antiquities, of Greece and Rome and the art of earlier cultures. But on this occasion I first realised his amazing command of the English language. Although he had not been in England for over 40 years, his contribution to the scientific work of the small Congress was an extempore lecture given with absolute mastery in the simplest and most perfect English without any notes.

"These impressions were confirmed during 1922 when I studied with him and got to know him. Like his psychology, his personality was really one to concern itself with individuals. The aloofness, which was never indeed coldness or hauteur, but rather indifference to superficialities, vanished and one met a vivid, eager mind seizing on every detail with astonishing interest and attention. The vitality, the current of his great energy was felt. How he disliked preambles and polite nothings! My first analytic hour with him he opened—contrary to rule and inadvisably—saying, 'Well, I know something about you already; you had a father and a mother!' meaning of course, 'Quick, I can't wait for you and your inhibitions, I want something to start with; give me an outline to get hold of!' He would allow himself liberties with his medium, like any master, until he recognised a new problem and bent himself as a student to that.

"But whether in analysis or not, his interest, with all its intolerance of preliminaries and imperativeness, was curiously impersonal. One had always the impression of a certain reserve behind the eagerness, as though it were not for himself that he so peremptorily demanded to understand things, but for some purpose outside himself. There was a simplicity in this impersonal eagerness that was perhaps the most significant thing about him. He was so concentrated on the inquiry he was pursuing that his self functioned only as an instrument. His penetrating attentive eyes had not only the simplicity and innocent clearsightedness of a child—one for whom nothing is too small, and nothing either common or unclean—there was also in them a mature patience and caution, and detached inquiry. The half-peering and half-piercing gaze beneath the heavy brows showed a power to see beneath the surface and beyond the boundaries of ordinary perceptions. But it also expressed a capacity for patient, careful scrutiny and for suspended judgment so rare as to be unrecognisable by many; his cool scepticism has even been misread as cynicism or pessimism. There was in him a conjunction of the hunter on an endless trail and the persistent, immovable watcher who checks and revises, it was from this conjunction that his power of discovering and understanding the sources of the feelings and behaviour of men and women sprang. Indomitable courage and tenacity, coupled with an unswerving honesty, were the characteristics supporting his gifts of observation, his 'intrepid imagination' and insight, which led to his great achievements. Both these capacities, the power to see new facts and to check his observations, diminished considerably in him after his operation in 1924.

"Along with these qualities, to which essentially we owe his great work, his personality had many very human features which endeared him to his friends. The inimitable dry humour of his writings became in ordinary intercourse a charming gaiety and capacity for finding amusement in most situations; and though he could be tolerant and philosophical, he was apt to be both impatient and intolerant. His humour was often witty and barbed, and he could be choleric, resentful and unforgiving. Nor would I claim that he suffered fools gladly. He was compelled by destiny to be a great man in his work, but he lived his private life as an ordinary man, and he believed in that kind of life. He disliked pathological types and extremes of any kind. From this attitude of mind his intolerance of religion in my view largely derived, for religion tends to see life in black or white and cannot accept the compromises and complexities in it which are the subject matter of scientific psychology. Once when a heated discussion on political topics arose, he was accused of being neither black nor red, Fascist nor Socialist, his amused reply was, 'No, one should be flesh colour'—the colour of ordinary men. And again, apropos of a young scientist interested in psycho-analysis who might have proved of service to the new science, Freud said to me mournfully, 'But I can't regard it as normal, you know, that he has married a woman old enough to be his mother.' I could but laugh at the discoverer of the Œdipus complex, and he met the laugh with a twinkle, but he was seriously disappointed.

"In later life a certain reserve, dislike of publicity, and a concentration of interest on his work was characteristic of him; one surmises that this trait had developed as a result of the hostile reception for so long accorded to his discoveries. But he was no capricious hermit; numerous eminent contemporaries, especially in the literary world, sought his acquaintance and met or corresponded with him; among these were notably Romain Rolland, Thomas Mann, Arnold and Stefan Zweig. But any genuinely inquiring visitor, too, could always see him, and met with a frank and friendly reception. Whatever the outcome of the interview, those who preferred fair dealing to favours found nothing in him to alienate them. Above all, Freud was entirely without pose. He could be mistaken, but deception or disingenuousness were not to be found in his nature, and this essential honesty was the hall-mark of his mind. He wrote: 'I can say I have made many beginnings and thrown out many suggestions. Something will come of them in the future though I myself cannot tell whether it will be much or

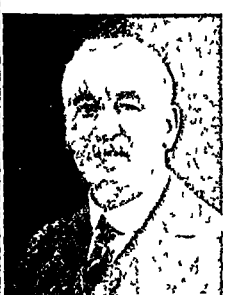
little' These words sum up and express the fearlessness, the acceptance of truth and love of it which characterised him and inspired his work"

GEORGE REDMAYNE MURRAY

M D CAMB, F R C P

FEW medical men have been so friendly to their colleagues and so beloved by them as George Murray, who died at his home, the Manor House, Mobberley, Cheshire, on Sept 21 For many years he had been ailing with cardiac pain on exertion Lately when prevented from taking active exercise he retired from practice as a physician

Born at Newcastle on Tyne on June 20, 1865, the son of a famed physician Dr William Murray, he was educated at Eton, of which he was always an attached alumnus, and at Trinity College, Cambridge From Cambridge he passed on to University College, London, where he took the Fellowes gold medal and qualified in 1888 Then came a year or two of study in Berlin and Paris and after this he commenced practice in Newcastle It was when he was lecturer at Durham University in bacteriology and comparative anatomy that he did the piece of work which has made him world-renowned In July, 1891, at the Bournemouth B M A meeting he read a Note on the Treatment of Myxœdema by Hypodermic Injection of an Extract of the Thyroid Gland of a Sheep It was soon discovered that given by mouth the remedy was equally potent in dispelling the symptoms of myxœdema, and the use of the remedy in cretinism quickly followed



J Ingham and Sons

In 1893 Murray was appointed Heath professor of comparative pathology and from 1898 to 1908 he was physician to the Royal Victoria Hospital, Newcastle In the latter year the chair of medicine at Manchester became vacant by the death of Julius Dreschfeld One of the terms on which the university had then recently given the site of Manchester Royal Infirmary to the trustees was that if the university appointed as professor of medicine a man not already on the infirmary staff he should become an honorary physician and have the care of a fifth of the medical beds The choice of Murray for the vacant post raised a storm of local opposition Murray, having accepted it, avoided controversy and by his friendly attitude to all around him and by his worth as a physician, soon made things work smoothly so that in 1925, when he retired from the active staff, the medical school *Gazette* wrote "With his curious lack of self consciousness and a personal charm which in itself amounts to genius, he has made an ideal representative of a great university I do not think I have ever had a conversation with him however brief from which I have not learnt something of interest expressed or implied I have never seen him angry I have never known him bad tempered Always he has proved himself a friendly and kindly adviser"

During the war Murray served in the R A M C with the 2nd Western General and the 57th General hospitals, later, as temporary colonel in the A.M.S he was consulting physician to the British Forces in Italy (1918–19) Many honours came to him He was a deputy lieutenant for the county palatine of Lancaster, president of many medical societies, including the Association of Physicians, and Goulstonian and Bradshaw lecturer Honorary degrees of M D were conferred on him by Durham and Dublin and the former gave him the D C L As a statutory commissioner for Durham University he took an active part in the rearrangements there

He was a man with many friends, we need only mention Victor Horsley, Michael Foster, Humphry Rolleston and John Cowan At Eton and Cambridge he was a keen oarsman, rowing in the Eton boat at Henley in 1883 Later, fishing was his chief hobby, and this with shooting and gardening filled in his spare time His widow was the daughter of E R Bickersteth, F R C S, of Liverpool They had one daughter and three sons, of whom two lost their lives in war service To Mrs Murray the Medical Benevolent Fund in the district owes a deep debt of gratitude

WILLIAM CALDWELL

M D, S C D DUBL

THE sudden death of Dr Caldwell at his home in Harcourt Street, Dublin, on Sept 1, has caused widespread regret In normal health, as far as he knew, until a few days before, he was seized by an anginal attack, from which he rallied, but which recurred and proved rapidly fatal Caldwell, who was born in co Antrim, was educated at Queen's College, Belfast, where he took a degree in science He was then appointed assistant to the late C H Thompson in the school of physiology at Trinity College, Dublin After Thompson's death in 1918, having in the meantime taken the degree of Sc D Dubl, Caldwell accepted the chair of physics and chemistry in the school of the Royal College of Surgeons While performing the duties of this post he found time to take his medical course in Trinity College, qualifying in 1930 Having resigned his chair he built up a considerable general practice As a teacher Caldwell was clear, painstaking and much interested in his pupils, as a practitioner he was popular with his patients and colleagues He leaves a widow and three sons, one of whom is in practice and another nearly completing his medical course

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SIR JOHN LYNN THOMAS who died at his home in Cardiganshire on Sept 21 at the age of 78, was one of the great figures in Welsh surgery He was a student at the London Hospital, where he qualified in 1886, and after doing house appointments there he returned to his native Wales to become first a resident and then a surgeon at the Cardiff Royal Infirmary He was in charge of the Welsh Hospital in South Africa in 1900 and, as deputy inspector of military orthopædics, helped Robert James to organise that side of the army medical services in 1914–18 Since then he and his colleagues have made the Prince of Wales Hospital at Cardiff an orthopædic centre for Wales and he has played a big part in establishing the Welsh National School of Medicine Lynn Thomas was made C B for his work in South Africa and became C M G in 1917 and K B E in 1919 He retired from practice eighteen years ago He leaves two daughters

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

PARLIAMENT was grappling last week with some of our new problems on the Home Front There is the problem of organisation of supplies and the problem of profiteering, about which many complaints were made. But the very great change in our lives, that of the redistribution of population brought about by the evacuation of school-children from the cities, preoccupied the minds of most members. This evacuation problem and the allied one of civil defence of the cities and vulnerable areas have to be settled in the House of Commons. On military questions the House must and does act according to the advice of the military advisers; on the home front it is the M P s, the local government representatives and the national and municipal civil services who are the advisers.

It is already clear that the new rural population of children and women will need new medical and social services. The food service, speaking generally, is going well and the provision of a communal meal for all school-children in rural areas will help with and facilitate distribution. More attention is being paid to the conservation of human resources in this war than ever before, and one questioner elicited the reply that medical, dental, metallurgical and biological students will not be used for what was described as "normal combatant duties." The questioner stated that this would produce "a population of twittering scientists." But this somewhat Blimpish point of view got little sympathy. To waste medically and dentally trained personnel on ordinary combatant duties is clearly bad military organisation, although the difficulty will be to prevent such students getting away from their studies in order to do combatant work Most young men want to do it It is particularly necessary to conserve the members of medical services because the training is necessarily long and the supply of personnel only just enough. It is to be hoped that no romantic militarists will be let loose in this field or they may seriously damage our military efficiency.

* * *

A point of some importance which came up at question time was that of the pay of trained nurses According to an answer given by the Minister of Health to Captain Elliston, this pay is to be £90 a year plus board, lodging and laundry. But in a number of cases nurses have been enlisted by local authorities for mobile first-aid posts and other A R.P. duties and put on the scale of £2 a week, all inclusive, which is applicable to trained first-aid workers without nursing training in the ordinary sense. The matter appears to be due to one of the temporary dislocations fostered by the war, but it should be remedied at once as it is causing grave hardship in many cases On this point too, why the difference in pay between men and women A.R.P. workers? The flat-rate for men is £3 a week but for women only £2 There is no doubt a case for differential rates of pay because of different duties performed. But if the duties are the same? And if the women members of the services have responsibilities for ailing relatives and children, as many have, should they not get the same rates as men with similar responsibilities?

The new time scale of parliamentary proceedings came out very clearly on Wednesday, Sept. 20 Questions and the Prime Minister's statement on the war situation—the weekly statement—occupied from 2 45 until 6 45 P.M. After this the second reading of a bill was taken which deals with possession of mortgaged land under the emergency provisions arrangements. This is the type of bill which in ordinary times would have occupied a whole session of debate from 4 P.M. till 11 or even later. Last week it occupied 26 minutes, and the House adjourned at "thirteen minutes after seven o'clock." It is not only that members, like other people, want to get home in daylight, for some debates have recently lasted till nearly 11 P M. But all discussions now have a different perspective of importance. The other major debate of last week was on the Ministry of Supply and ... on until after 9.30 P.M. and the Government did not have too easy a time Mr. Greenwood for the Opposition expressed a very clear disagreement with the "non-possumus" attitude of some senior civil servants It was Pitt, I believe, who, on someone speaking of "impossibilities," got up on his gouty feet and said he was standing on impossibilities. The Labour movement, and particularly the T.U.C. and the skilled trade unionists, mean to pull their weight and insist that in this business they must be "in on the ground floor."

* * *

And so we turn to the War Budget The last Budget introduced by Sir John Simon attracted very much less parliamentary attention than usual because of the international situation. But the War Budget will certainly attract a great deal and Parliament will discuss it on Wednesday, Thursday and Friday By the time these words are in print we shall all know where we stand. Speculation on details is in vain But the general hope is expressed that we do not try and finance the war by borrowing on too great a scale

QUESTION TIME

SEPT. 21–22

Medical and Dental Students and Combatant Service

Rear-Admiral BEAMISH asked the Secretary of State for War whether his attention had been drawn to a letter issued to Cambridge undergraduates in which it was stated that medical students, research or post-graduate students in engineering, metallurgy, chemistry, physics, mathematics and biology would not be used for normal combatant service, and whether this was issued with the approval of his department—Sir V. WARRENDER (Financial Secretary to the War Office) replied: I have not seen the letter referred to, but it has been agreed that medical and dental students who have attained a certain stage in their medical and dental studies should complete those studies with a view to medical or dental employment with the forces or as civilians. Arrangements have also been made to secure that the services of the research and post-graduate students mentioned in the question should normally be used, either in the Forces or in civil life, in such a way as to make the best use of their scientific or professional abilities.

Mr. EDE: Does that apply to other universities than Cambridge—Sir V. WARRENDER: Yes, Sir. It applies to all students studying these scientific subjects

Availability of Radium

Mr. Charles TAYLOR asked the Minister of Health whether supplies of radium were now available for patients who were in urgent need of this treatment.—Miss HORS-

BROOK replied I understand that in view of the great danger to the public which would exist if radium were dispersed by high explosive action, the Radium Commission and other holders have caused their radium to be deposited in places of safety and that it is not at present available for therapeutic purposes Provision for X ray therapy is being as far as possible maintained I am communicating with the commission with a view to their considering the possibility of making radium available for treatment subject to suitable safeguards

Evacuation Another Chance?

Miss WARD asked the Minister of Health whether he could arrange for a further opportunity in the near future to register for evacuation to be given to mothers with young children, expectant mothers, cripples and blind persons.—Mr ELLIOT replied In a circular letter of the 7th September I informed the local authorities that it was desirable that parents of school children resident in evacuating areas who did not take advantage of the Government scheme should be granted a further opportunity to register their children in the event of any further movement being found possible This further registration is limited to children of school age who would be evacuated without their parents, and it has now been carried out in most of the evacuation areas The further evacuation of members of the priority groups other than unaccompanied school children will have to receive careful consideration in the light of experience

Nursery Schools in Reception Areas

Mr THEW asked the Parliamentary Secretary to the Board of Education whether, in view of the large number of children under five years of age now likely to be permanently resident in reception areas, any steps had been taken to provide emergency courses for trained assistants in nursery schools.—Mr Kenneth LINDSAY replied The question of providing for children under five years of age in the reception areas is being actively considered by the departments concerned The needs of the present moment are, however, too urgent to wait for the establishment of nursery schools of the ordinary type, and must be met by more makeshift measures While arrangements for training helpers may have to be made such training would necessarily be different from that given in ordinary circumstances to trained assistants in nursery schools

Cheap Milk for Mothers and Children

Mrs ADAMSON asked the Minister of Health whether he was prepared to put into operation immediately the scheme for the provision of cheap milk for mothers and young children on the same basis as the milk in schools scheme, so as to ensure that the cheap milk would be available on application to any expectant and nursing mother and preschool child.—Mr ELLIOT replied The scheme for this purpose made by the Milk Marketing Board and approved by the Minister of Agriculture and Fisheries came into operation on July 31 I have received proposals under the scheme from a number of welfare authorities, and these are at present being examined by my department in consultation with the board, and I hope it will be possible to put them into operation at an early date

Nurses at First-aid Posts

Dr HADEN GUEST asked the Minister of Health, whether he was aware that experienced trained nurses and nursing sisters had been invited to volunteer for national service in London, and on appointment by borough councils had been paid £2 a week, the salary of first aid workers and whether a different scale of salaries could be established for trained nurses.—Mr ELLIOT replied The standard rate of £90 a year for a trained nurse plus board lodging and laundry, is applicable to a nurse employed by the borough council at a first-aid post under conditions laid down in a recent circular He would be glad he added, to look into any cases which were brought to his notice

Vaccination of Soldiers

Mr RHYS DAVIES asked the Secretary of State for War if he would make it clear to the responsible officers that vaccination of soldiers was not compulsory.—Sir V. WARRENDER (Financial Secretary to the War Office) replied A man is not enlisted into the Regular Army on a normal engagement unless he consents to be vaccinated Vaccination will not be compulsory in the case of other soldiers, and instructions have been issued to this effect

Night-baking

Mr BANFIELD asked the Home Secretary whether, in view of the severe hardship now being experienced by night bakers owing to the absence of ventilation due to the black-out, he would consider prohibiting night-baking between the hours of 6 P.M and 6 A.M.—Sir JOHN ANDERSON replied I have had special inquiries made from which it appears that while conditions as regards temperature and ventilation were in some cases adversely affected at first by black-out arrangements, they are now being improved On the information before me, I do not think that such new factors have arisen as would justify the prohibition of night baking at the present time

Extension of Summer-time

Sir JOHN ANDERSON (Home Secretary) announced that the Government proposed that summer time should this year be extended until the night of Nov 18–19

IN ENGLAND—NOW

(FROM OUR PERIPATETIC CORRESPONDENTS)

AT the end of three weeks of war, one of my chief impressions is of innumerable committees, medical board meetings, and interviews with house-physicians and surgeons and others who want answers to questions, which neither I, nor indeed the various officials who ought to know, seem able to give Incidentally, the capacity of officials to avoid giving a straight answer to a straight question, especially in writing, fills me with awe, in these weeks I have only come across one, a group officer and a surgeon, who if he obviously had not an answer to the question, said with refreshing frankness, "I don't know"

In Liverpool, with our target of docks (I suppose that by now the Germans have learned from their secret service that we are a seaport, and therefore I am not giving away secrets to the enemy), we most of us expected an early visit from the bombers By now, however, we have had time to assess a little more clearly some of the hospital problems involved in the transition from nominal peace to actual war "Extreme peril authorises many measures which should be rejected under other circumstances," said our old friend Celsus, and the provision of large numbers of empty beds for probable air-raid casualties was surely fully justified Had there already been heavy bombing of towns, a government which had failed to provide adequate numbers of beds for the casualties would have been severely criticised, and by none more than our own profession But all of us who have seen how the plan has affected our own hospital patients feel strongly that better provision must be made for them in any future evacuation Administrators may juggle with figures on paper, so that Parliament and people may be assured that a particular number of empty beds are now ready for casualties, but the practising doctor knows that his bed-ridden cases, transferred elsewhere because they are not fit to send home, still need skilled and adequate medical and nursing attention, bed pans and urine bottles It is of course just because practising doctors have a moral responsibility for the welfare of John Smith and Maggie Brown and Tommy Robinson that they are sensitive to the "faults in the machinery," and there is no doubt that goodwill and cooperation can put right difficulties which have arisen largely from the pressure of these initial days of war

It has been interesting to watch the functioning of medical boards of voluntary hospitals when con

fronted with the need for organising their own hospital duties in time of war. The members of my own medical board are pretty strong individualists, of diverse and specialised experience, and we were faced with the need for common thought and action to meet an urgent problem, and to fill in the practical details of an already prepared skeleton scheme. The give and take of discussion, and the sharing of initiative and responsibility, have produced a strong unity not only of general purpose but also of detailed organisation. I find it a mentally exciting experiment in true democratic method, and it works well. These meetings are far more satisfying in their results than were most of our medical board meetings in recent years of peace; the urgency of the times has intensified our sense of common purpose, we are less selfish and are willing to give more time to putting forward our own views, to listen to others, and to allow the common "sense of the meeting" to emerge. Perhaps it could not have happened had we not had leisure forced upon us by a great diminution of consulting and hospital practice since the war began, and our hospital beds were largely emptied; we are not distracted and hurried by the thought of all the work which is being interrupted by the meeting.

Whatever may be the social consequences of football pools, I imagine that Professor Davie will be relieved to hear that professional football and the pools are to go on; for large numbers of the girls employed in the offices of various pool firms are on the list of donors for the war blood bank. Certain offices vied with each other in providing volunteers, and scored remarkable figures These donors are not now likely to diffuse out of Liverpool.

By the way, the blood of Liverpool is sound. Out of some 5000 volunteers, men and women, whose blood was tested for blood bank purposes, only two were found to have a positive Wassermann reaction.

"I'll tell you what I'd do to Hitler," said a meek-looking man to another, in the tram going home; "I'd do what they did to Napoleon—send him to St. Helens."

* * *

I went on Monday to see my mother, a sprightly old lady of 85, who lives on the outskirts of a country town some twenty miles from London. She was revelling in the mild warm weather after the change from heat to cold of the previous week and, my sister being out, walked about the sitting-room changing all the cushions from one chair to another. We decided to have our chat in the garden, where again she refused to sit in the first four places in which I put her chair, and finally, revolting even against my choice of seat, sat herself upon the hard garden one. We had got through her aches and pains, the story of her last two tenants including why they left, and had reached A.R.P., when my sister came in with an elderly cousin The conversation at lunch turned to the subject of the Londoners billeted in the town, and I had to protest against the tacit assumption that the arrivals were a sort of inferior race. First I drew my mother's attention to the fact that the term for them was evacuees, not refugees, which we apply to those more unhappy persons who have escaped from persecution. The Londoners had not fled from the brutalities of the Metropolitan Police, but had been emptied out of their homes by these and other kindly officials. It was while we were discussing the disposal of the family dining-table that my sister spoke of "those Londoners" in a tone of superiority. It all arose out of the need of cutting down fuel expenditure. They will not be able to have a fire in both their rooms every day in the coming winter, and so the dining-room is to become their sitting-room, the drawing-room being for A.R.P. Now the old table at which, with two leaves and another one an inch higher added at the end, the family circle used to gather to the number of twenty or more on New Year's Eve is already too big for the room, and what were they to do when they had moved in a sofa for my mother to rest on with her feet up? The suggestion was that they should give it—lend, said I, not give—to the hostel that was being fitted up for the reception of expectant mothers. It was then that my sister said, "I don't quite like it going for the use of *those* Londoners." I drew myself up to my full height—we had finished lunch and I was standing in front of the fireplace drinking a cup of tea—and throwing back my shoulders said: "If the old family table is to go, no better purpose can it be put than for the use of London evacuees and their babies; surely" I added, "it is a very good idea, the hostel will be grateful to you for your generosity, and you will get it housed free, gratis, and for nothing for the duration of the war. It may of course get a bit stained." "Oh! that won't matter," granted my sister, "no one will want the old thing." "There, my dear, you're wrong," said I; "not you or I; but in 60 years' time Pip (that's my granddaughter now aged one) will be showing off that table as a lovely piece of mid-Victorian light oak. 'And,' she will say, 'do you know, that during the second German war they actually let it be used in a home for babies. There's the stain where the nurses used to throw down the nappies' And at that, if she is as like her grandmother as she promises to be, she will bend down and rub and polish trying to get out the stain that'll be one of the prides of her life." So I think the table will go.

The rest of the week I have spent in practising economy of petrol ready for tomorrow. I throw out my clutch at every little decline; I do not go down into second, at the corners, as often as I used, and hope this will not result in damage to the car At the lights I turn off my engine. When I am at the back of the block at a main cross-road this works well; but when I am at its head before quick-changing lights it results in disturbing hoots behind me when I do not get off at the yellow. It is remarkable how the driver's emotion can get into the hoot of his car But most valuable of all, I am learning to obey the law in the built-up areas, for I know that my car runs best at thirty miles per hour. The funny thing is, I am no later at my destinations. I have already had an aluminium plate fixed in front of one half of my radiator, for the doctor seldom runs far at once and always, therefore, with a cold extravagant car. Even if I get a special ration, with all my economy I foresee it is going to be hard to do my work. Walking will do me good, and I am looking to the soles of my boots. I am also thinking of a push-bike.

* * *

In Bristol we are fortunate. There has been almost no dislocation of our lives. Of course a good many government departments have descended upon us, but no evacuated schoolchildren or mothers and babies—for we are a neutral area The university is to receive the medical students from the Middlesex. Our medical staffs are almost intact, mainly because we have very few young men on our hospitals Our hospitals were emptied by order on the outbreak, but since no civilian casualties have occurred we are allowed to readmit ordinary cases again. The Conjoint is making Bristol one of its centres. I can't say how the additions to our university will affect us, but the work under new conditions hasn't begun yet. Meanwhile you must remember how very unexcitable Bristol is. I think our medical preparedness is much better than it was in 1914. Our local emergency medical committee works smoothly and well.

* * *

It is difficult to say how things will work out here in Cardiff. We expect a number of evacuee students. Along with this, the number of beds available at the Cardiff Royal Infirmary has been cut down to 200, and we are trying to arrange for the greater use of Llandough hospital, which has also been cut down to 175 beds and is rather far away from the centre of

niversity of Cambridge

Full arrangements have been made for the teaching of natomy and physiology in the coming term The regulation requiring a candidate for the final M.B., B Chir to ave obtained honours in a tripos or in a part or section of tripos, will be suspended There will therefore be a greater number of students ready to start clinical work in October than usual so the university contemplates giving three months course in pathology in conjunction with preliminary clinical work at Addenbrooke's Hospital . is hoped that a course for the examination in pharmacology will be given every term in conjunction with a course in pathology

niversity of Leeds

At recent examinations the following were successful

FINAL EXAMINATION FOR DEGREES OF M B CH B.

Part II.—P Rapaport (second-class honours) T Akroyd B Ashmore C H Boyd, P A Dobb Jean L Edwards, A Everatt G Farrer, J H Foxton W M Frais H Haldstone, Mary L Goodson A Greenwood Joan I Greenwood G Higgins A Markby L H Moss G H Sayle, E Sandy, W Sheffield F H Tordoff T R Wilson and D S Young

FINAL EXAMINATION FOR DEGREE OF B CH D

L I Friend

FINAL EXAMINATION FOR L.D.S

D D Abel D Barker and K H Champlin

D P H

Mary Townend

D I M

J R Peberdy

University of Glasgow

Dr A M Wright Thomson will deliver a lecture on ocular therapeutics at the Tennent Memorial Building 39, Church Street, on Tuesday, Oct 3, at 4 30 P M

Royal College of Physicians

The Harveian festival, including the oration which was to be held on Oct 18, has been cancelled

General Medical Council

Prof J H Burn has been nominated by the King on the advice of the Privy Council to be a member of the General Medical Council in succession to Sir George Newman

Royal Society of Medicine

The society's house reopened on Sept 18 and will be open from 9 A.M to 5 P M including Saturdays until the evenings draw in, when the hour of closing will be earlier Meetings will be held in the mornings and early afternoons as notified on the diary card Proceedings will be published monthly, and the library services will continue as usual Fellows who are in the fighting services are invited to communicate their service titles and address to the secretary as soon as possible in order that adjustments may be made in subscription rates

working under the local authorities in Sanitary Inspectors' Association, in succession to the Sanitary Inspectors' War Service Committee, which was formed during the war to do today, as ready to carry on the work which the military organization The private members' work of the Association will be sent to the Headquarters, 108 North Street Glasgow.

EMERGENCY NOTICES

The dinner for old students of the Welsh National School of Medicine, Cardiff which was to have taken place in London on Oct 14 has been postponed indefinitely

The autumn meeting of the British Orthopædic Association which should have been held in Cardiff on Oct 27 and 28 has been cancelled

The St Mary's Hospital annual dinner, arranged to be held on Sept 30 has been cancelled.

The examinations for the membership and diplomas of the Royal College of Obstetricians and Gynæcologists will be held as previously arranged

The autumn exhibition of the medical art society will not be held

The work of the Universities' Federation for Animal Welfare is being continued from Gordon House, 29, Gordon Square London W.C 1

The Lancet 100 Years Ago

September 28, 1820, p 8

From an account of the London medical schools

Education *should* be free and unfettered It is coloured cribbed, confined, But though we demand its emancipation yet until its freedom is achieved, we must bend to the duties of the time, and render to the objects of a despotic and oppressive rule, expositions of its enactments, and of the mode of compliance therewith, in order that the penalties of infringement or neglect may be avoided . But incomparably more gratifying would be the duty of opening to his view, the pure, broad, sparkling streams which must flow from the natural fountains of knowledge, than that of mapping down the artificial conduits and turbid tanks of the usurping dispensers of the waters of science) At present medical education is bound as to periods, places, and pursuits Pinned to the earth, like the prostrate Gulliver, by the hair, the arms, the feet it has neither life nor motion nor power to look around Escaped from the enemies who made it captive in the days when education was asleep free as its legs—at will—an intellectual giant, I mustered from the pygmy foes,—assume a noble part

Notes, Comments and Abstracts

A COMMUNITY OF CHILDREN

THE Caldecott Community has for many years been providing refuge and education for "normal children from abnormal homes" As the world becomes more and more abnormal the scope of such work must change and widen, and we learn that fifteen refugee children have already been admitted to the community, and that evacuated children who were unhappy or difficult in their billets have also been received. A scheme of preliminary investigation and examination of children before their admission has now been introduced, and the examination is made at the Tavistock Clinic

The community has no endowment and is in urgent need of money. Though calls for help are now innumerable, there will be some of our readers who feel that the sound care and happiness of children is one of the objects they most wish to promote. Those interested can get further particulars from the hon directors, The Mote, Maidstone, Kent.

ROTES KREUZ AND HACKENKREUZ

IN a disarming article in the *Wiener Klinische Wochenschrift* (1939, 52, 258) Dr. Walter Ott, Generalfuhrer of the German Red Cross, soothes any scruples the conscientious Nazi may have about the orthodoxy of the principles on which his organisation is founded. He admits that some years after its foundation—in the times of liberalism when so much sentimental nonsense was talked in the name of humanitarianism—the red cross may have assimilated a slightly pacifist flavour. But he points out the original idea of the movement was born on the battlefield and developed during the various wars of the past and especially during the world war Any doubts that may have arisen in the minds of his readers are simply due to looking at the subject from the wrong standpoint. If they think back to their own experiences in the Great War they will remember that after the hatred of battle has died away the soldier regards his wounded enemy with different feelings. He recognises him as one who, like himself, is but fighting for his native land; he sees him no longer as an enemy but as a man honourably wounded in battle, with whom he is ready to share his last cigarette and drink of water Regarded in this (?) less sentimental light Dr. Ott is confident that the Nazi will recognise the red cross as the expression of a heroic chivalry.

GOLDEN LOTUS

THE bound feet of Chinese women are discussed in all their aspects—historical, anatomical, physiological, pathological, geographical, and psychological—by A. Bigot, who concludes that they constitute an artificially produced variety of the otherwise congenital deformity known as club-foot or talipes equinus (*Rev. méd. franç. Ext.-Orient*, April, 1939, p. 321). This production of club-foot by intentional compression, begun at a tender age, tallies with Denis Browne's theory of intra-uterine compression of the fœtus as the cause of congenital talipes (*Lancet*, 1934, 2, 969); indeed he refers to the "relevant experiments on the female human foot" made by the Chinese (*Brit. med. J.* 1937, 2, 570) Bigot shows that compression dislocates the head of the astragalus, a dislocation adduced as the cause of congenital club-foot by E P. Brockman, who asserts that it is not due to external compression but to "an atresia of the socket into which the head of the astragalus normally fits" (*Ibid.* p. 572). This custom of *kin-lien*, meaning "golden lotus," is confined to China, where it has flourished fifteen hundred years owing to the deeply rooted foot-fetichism of the inhabitants, to the exclusion of the many other mutilations to which women throughout the world submit in the cause of mistaken beauty.

Vacancies

Burnley County Borough —Asst M.O , £850. Also sen M.O H , £800
Cambridge, Addenbrooke's Hosp.—H P , at rate of £130.
Chelmsford Borough —M O H and school M O , £800
Doncaster Royal Infirmary —Orthopædic H S , at rate of £ Also H S at rate of £150
Dudley, Guest Hosp —H S , £150
East Sussex County Council —Deputy M O H. and de school M O , £850
Harrow Urban District Council —Asst. M O H , £600.
Ipswich, East Suffolk and Ipswich Hosp —H S and cas O.,
Macclesfield, Cheshire County Mental Hosp , Parkside.— M O , £350
Manchester City —Asst tuber officer, £650
Manchester, Northern Hosp.—Hon. surgeon
Manchester Royal Infirmary —Res registrar to surgical patient dept , at rate of £150
Manchester, Victoria Memorial Jewish Hospital.—Orthop surgeon.
Plymouth City General Hosp —Asst M O , £300
St Helens County Borough —Temp. Asst M O H. for tu culosis, £600.
Stoke-on-Trent, North Staffordshire Royal Infirmary — radiologist Also two H S 's, each at rate of £130
Scarborough Hosp —2 H S 's and H P , each at rate of £150
The Chief Inspector of Factories announces a vacancy fo examining surgeon at Kidwelly, Carmarthen.

Appointments

ALCOCK, WILLIAM, M B Sheff , B Hy., D.P.H , county me officer of health for Westmorland.
DAVIS, D R , M B. Camb , M R C P., assistant resident physi at the Runwell Hospital, Wickford, Essex.
MOFFETT, A. J , M.B Birm., F.R.C S , assistant surgeon to throat, nose, and ear department of the United Hosp Birmingham
STRANG, R. R. S., M B Glasg , F.R C S , D L O., assistant geon to the throat, nose, and ear department of the Un Hospital, Birmingham
TELLING, O H J. MAXWELL, B.M Oxfd, M R.C P., me registrar at the London Chest Hospital.
Examining Surgeon under the Factories Act, 1937: Dr R. FINN (Ashwick district, Somerset)
Leicester Royal Infirmary.—The following appointments announced —
ALLEN, E. P , M B. N Z , D M R., radiologist;
BICKFORD, B. J , M B. Lond , F.R C S , senior casu officer;
RIDDELL, MARGARET, M B. N Z , D.A., anæsthetist.

Births, Marriages and Deaths

BIRTHS

COPELAND —On Sept 20, in Calcutta, the wife of Dr. F Copeland—a daughter
DONALDSON —On Sept 22, the wife of Dr C. E Donaldson Dulwich Village, S.E.21—a daughter
FYFE —On Sept 21, the wife of Dr G M Fyfe, of Cupar, Fi a daughter
HARGREAVES —On Sept 22, at North Deighton, Yorks, the of Dr E R Hargreaves—a daughter.
LLOYD DAVIES —On Sept 19, at Southwell, Notts, the wif Dr. T. A Lloyd Davies—a son (who died a few hours lat
MARSH —On Sept 24, at Derby, the wife of Dr Frank Ma Masjid-i-Suleiman, Iran—a son.
SMYTH —On Sept 22, at Oxford, the wife of Dr Patrick Sm —a daughter
WEEKS —On Sept 20, the wife of Dr Albert Weeks, of Brist a son.

MARRIAGES

BLAKELOCK—AHERNE.—On Sept 23, at Reading, Luke He Blakelock, M.R C S , to Ethné Aherne, of Reading
BROWN—HAMILL.—On Sept. 18, at Birmingham, John Will Brown, M B , R.A.M C to Jean Hamill
COUNIHAN—HONAN —*On Sept 20, at New Malden, Surr* William Edward Counihan, M B., to Sheila Joanna Ther Honan
EXNER—RUSSELL.—On Sept. 21, George Gerhard Exn M.R C S., to Patricia Cornelia Russell.
HARMER—HIGGS-WALKER —On Sept 23, at Sevenos Michael Hedley Harmer, M.B , to Bridget Jean Hig Walker
SCHULENBURG—CROFT.—On Sept. 20, Richard Schulenbu M.B , to Ellen Croft, both of Cape Town, South Africa
WATERFALL—TIPP.—*On Sept 20, at Yealmpton, Plymou* William Blair Waterfall, M B , to Maurya L Tipp

DEATHS

FOLLIOTT —On Sept 21, at Wilton, Salisbury, Surgeon Co mander Edwin Folliott, M R.C S., R.N (retd).
MURRAY —On Sept 21, at Mobberley, Cheshire, George R mayne Murray, M.D. Camb., F.R C P
OULTON —On Sept 21, at Falmouth, Richard Henry Geo Oulton, L R C.P.I , aged 59.
POLLARD.—On Sept 26, at Cheltenham, John McFarl William Pollard, M D Lond., D P H , late A.D.M. Nigeria

Dr. Robert Mellis Library

Dr. Lambert Fields Library
U. T. M. Medical College
Class 79 Number